
Engineer Memoirs

**Lieutenant General
Walter K. Wilson, Jr.**



**US Army Corps
of Engineers**
Office of the Chief
of Engineers

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ENGINEER MEMOIRS

LIEUTENANT GENERAL WALTER K. WILSON, JR., USA, RETIRED

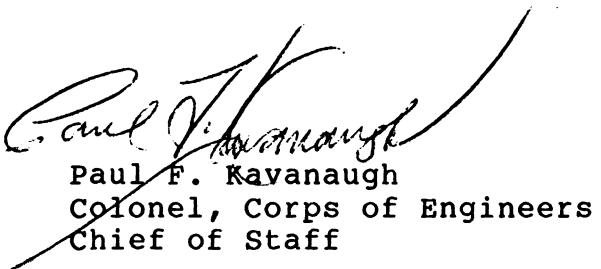
This manuscript is the product of a tape-recorded interview conducted by Dr. Paul Walker of the Historical Division, Office of the Chief of Engineers, with Lieutenant General Walter K. Wilson, Jr., USA, Retired, in Mobile, Alabama, in January 1978.

FOREWORD

Few retired officers or civilians of the U.S. Army Corps of Engineers ever set down a summary of their careers with the intention of sharing their acquired knowledge with others. As a result, our organization and the engineering profession have lost valuable information and an important perspective for present and future decision-making. This volume in the Engineer Memoirs Series attempts to correct the situation by preserving material of historical significance that is not available elsewhere.

Lieutenant General Walter K. Wilson, Jr., had a distinguished career in the Corps of Engineers which culminated with his selection as Chief of Engineers in 1961. I recommend this interview to thoughtful officers and civilian members of the Engineer family.

FOR THE COMMANDER:



Paul F. Kavanaugh
Colonel, Corps of Engineers
Chief of Staff

THE INTERVIEWER

Dr. Paul Walker, a historian in the Historical Division, Office of the Chief of Engineers, heads the OCE Oral History Program. He holds a Ph.D. from the University of North Carolina, Chapel Hill, and is the author of Engineers of Independence: A Documentary History of the Army Engineers in the American Revolution: 1775-1783.



WALTER K. WILSON, JR.

Lieutenant General Walter K. "Weary" Wilson, Jr., began his association with the U.S. Army when he was born on August 26, 1906, at Fort Barrancas, Florida, where his father was stationed as an Artillery officer. Subsequent assignments took the Wilson family to Washington, D.C., and to Hawaii, where the younger Wilson decided on a military career. After attending the Army's West Point Preparatory School at Schofield Barracks, he entered the Military Academy in 1925 with plans to seek a commission in the field artillery. His class standing upon graduation in 1929 made him eligible for a commission in the Corps of Engineers. He accepted his father's advice, entered the Corps, and embarked on a distinguished career that spanned 36 years.

Wilson's first assignment as a young second lieutenant was as assistant to the District Engineer in Mobile. Fourteen years of troop command, staff assignments, advanced study, and a teaching appointment at West Point followed. In October 1943 he reported to India as Deputy Engineer-in-Chief in the newly formed Southeast Asia Command under Lord Louis Mountbatten. He remained in the China-Burma-India Theater throughout the war, spending the last eight months commanding American troops and overseeing the demobilization effort.

Returned to colonel from the rank of brigadier general, which he had achieved at the age of 38 while in India, Wilson took command of the St. Paul Engineer District in June 1946. From there he went to Mobile as District Engineer in 1949. This was his first experience with a heavy workload in both civil works and military construction. Wilson left Mobile for a brief term as South Atlantic Division Engineer and then moved to Morocco for a two-year tour as Mediterranean Division Engineer. Drawing upon his experience in Mobile, he guided the Division through the complicated process of conversion from cost plus a fixed fee to lump sum, fixed price contracting. Wilson also gained valuable experience managing projects for the Air Force.

General Wilson was Deputy Chief of Engineers for Construction in a period when the Corps became heavily involved in major construction projects supporting the ballistic missile and space programs. In August 1960 he left OCE to command the Engineer Center and Fort Belvoir,

but his broad-based background in the Corps' civil and military activities and the respect he had gained in Congress, the military, and the construction industry led to his selection as the 40th Chief of Engineers by President Kennedy. As Chief from 1961-1965, Lieutenant General Wilson guided the Corps through a difficult period of Army reorganization which saw the Corps retain its chief while other branches of the Army lost status. Pursuing his philosophy that "the head man should see and be seen," he traveled extensively, visiting Corps field offices and projects and Engineer troops.

Among the citations, decorations, and public service awards he received are the Distinguished Service Medal, the Legion of Merit with Oak Leaf Cluster, the French Legion of Honor, and the Department of Defense Distinguished Service Citation. In 1962 Kiwanis International and the American Public Works Association honored General Wilson and the Corps of Engineers by naming him one of the top ten Public Works Men of the year. Three years later he received the National Aeronautics and Space Administration Medal for Outstanding Leadership.

After retirement from active duty in 1965, General Wilson returned to Mobile as vice president of Southern Industries Corporation, a conglomerate whose subsidiaries produce and market aggregates for the construction and chemical industries. In 1966 he also became chairman of Mobile's Task Force 200, an industrial development agency of the Chamber of Commerce. In addition he chaired a board arbitrating construction claims on the Hell's Canyon project and led an inspection team reviewing construction programs in Vietnam for the Secretary of Defense. From 1971-1975 he served as a member of the U.S. Military Academy Planning Board which was established to advise the Department of the Army on the Academy's construction expansion program. General Wilson was credited with first recognizing the need to construct a high-level bridge on Interstate 65 over the Mobile River because of anticipated waterway development. In 1978 the state of Alabama named the bridge in his honor.

CAREER SUMMARY

September 1929 - August 1930

Assistant to the District Engineer, Mobile Engineer District, Mobile, AL

September 1930 - July 1932

Company Officer and Company Commander, Seventh Engineers, Fort Benning, GA

August 1932 - May 1933

Student, University of California, Berkeley, CA
(BSCE)

June 1933 - August 1933

Company Officer, Civilian Conservation Corps Camp, Blue Mountain, MS

August 1933 - June 1934

Student, The Engineer School, Fort Humphreys, VA

August 1934 - June 1938

Instructor, Department of Civil and Military Engineering and Military History, U.S. Military Academy, West Point, NY

September 1938 - June 1939

Student, Command and General Staff School, Fort Leavenworth, KS

July 1939 - February 1941

Company and Battalion Commander, Third Engineers, Schofield Barracks, Hawaii

February 1941 - August 1942

Instructor, Command and General Staff School, Fort Leavenworth, KS

August 1942 - October 1942

Engineer, Amphibious Corps, Atlantic Fleet, Camp Pickett, VA (temporary duty)

October 1942 - December 1942

Assistant Executive Officer, Engineer Replacement Training Center, Fort Belvoir, VA

December 1942 - March 1943

Commanding Officer, 79th Engineer Regiment, Camp Phillips, KS

April 1943 - May 1943
Commanding Officer, 1113th Engineer Combat Group

June 1943 - September 1943
Student, Army and Navy Staff College, Washington,
DC (including attendance at Navy War College,
Newport, RI, and AAFSAT, Orlando, FL)

October 1943 - August 1945
Deputy Engineer-in-Chief, Southeast Asia Command,
New Delhi, India, and Kandy, Ceylon, including
temporary duty in London and Washington, January -
April 1945

September 1945 - November 1945
Commanding General, Advance Section, United States
Forces, India-Burma Theater

October 1945 - April 1946
Chief of Staff of the Chinese Army in India;
Commanding General, Intermediate Section, United
States Forces, India-Burma Theater; Commanding
General, Base Section, United States Forces,
India-Burma Theater

June 1946 - June 1949
District Engineer, St. Paul Engineer District,
St. Paul, MN

June 1949 - September 1952
District Engineer, Mobile Engineer District,
Mobile, AL

October 1952 - April 1953
Division Engineer, south Atlantic Engineer
Division, Atlanta, GA

April 1953 - June 1955
Division Engineer, Mediterranean Engineer Division,
Casablanca, North Africa

August 1955 - March 1956
Commanding General, 18th Engineer Brigade and
Deputy Post Commander, Fort Leonard Wood, MO

April 1956 - November 1956
Assistant Chief of Engineers for Military
Construction, Office, Chief of Engineers,
Washington, DC

November 1956 - August 1960
Assistant Chief of Engineers for Military Construction, Office, Chief of Engineers, Washington, DC

November 1956 - August 1960
Deputy Chief of Engineers for Construction, Office, Chief of Engineers, Washington, DC

August 1960 - May 1961
Commanding General, U.S. Army Engineer Center and Fort Belvoir, VA

May 1961 - June 1965
Chief of Engineers, U.S. Army Corps of Engineers, Washington, DC

30 June 1965
Retirement from active duty, U.S. Army

August 1965 - August 1971
Vice President, Southern Industries Corporation, Mobile, AL

April 1966 - 1973
Director, Southern Industries Corporation, and Chairman, Task Force 200, Mobile, AL

1973 - present
Consultant

PROMOTION HISTORY

Grade	Temporary	Permanent
Second Lieutenant		13 June 1929
First Lieutenant		1 October 1934
Captain		13 June 1939
Major	16 October 1941	19 June 1946
Lieutenant Colonel	7 May 1942	15 July 1948
Colonel	4 March 1943	
Brigadier General	13 February 1945	
Colonel	16 May 1946	17 April 1952
Brigadier General	16 March 1953	2 April 1957
Major General	25 March 1957	22 June 1959
Lieutenant General	19 May 1961	

PERSONAL DATA

Date and Place of Birth
26 August 1906, Fort Barrancas, FL

Parents

Major General Walter King Wilson and Evangeline Taylor Wilson

Marriage

Jeanne Herman, Tuscaloosa, AL, 4 October 1930

Children

Two sons, Walter K., III and Frederick
Two daughters, Ellen Elizabeth and Margaret

Grandchildren

Seventeen grandchildren, Walter King Wilson, IV, (5/63); Robert Perry Amos, Jr. (12/63); Victoria Taylor Wilson (4/64); Jeanne Elizabeth Amos (11/64); John Newton Wilson, II (9/66); Elizabeth Kelly Wilson (6/68); Elizabeth Ashleigh Wilson (10/70); Dianne Lee Maumenee (4/71); Charles Sheridan Wilson (9/72); Kelly Dissette Maumenee (11/72); Stuart Alexander Wilson (10/73); Frederick Raymond Wilson (10/73); Julie McCabe Amos (3/74); James Griffin Wilson (9/75); Evangeline Kehoe Maumenee (4/76); Nicholas Axtel Wilson (1/79); and Lulie Stinson Maumenee (11/79)

EDUCATION

University of Hawaii, three months
United States Military Academy, West Point, NY (BS, 1929)
University of California, Berkeley, CA (BSCE, 1933)
The Engineer School, Fort Humphreys, VA (1934)
Cornell University, Ithaca, NY (1935)
Command and General Staff School, Fort Leavenworth, KS (1939)
Army and Navy Staff College, Washington, DC (1943)

CITATIONS AND DECORATIONS

Distinguished Service Medal
Soldier's Medal
Legion of Merit with Oak Leaf Cluster

Army Commendation Medal
Legion of Honor, Grade of Officer (French)
Battle Stars, India, Burma and Central Burma campaigns
World War II Victory Medal
American Defense Service Medal
American Campaign Medal
Asiatic-Pacific Campaign Medal
European-African, Middle Eastern Campaign Medal
Five Overseas bars

PUBLIC SERVICE AWARDS

One of top 10 "Public Works Men of the Year" (1962)
Distinguished Service Citation (1965)
National Aeronautics and Space Administration Medal
for Outstanding Leadership (1965)
Engineer of the Year, Mobile, AL (1967)
Golden Beaver Award for Engineering (1971)

PROFESSIONAL SOCIETIES

Society of American Military Engineers
Permanent International Association of Navigation Congresses
U.S. Committee on Large Dams
American Society of Civil Engineers
National Society of Professional Engineers

COMMISSIONS, COMMITTEES, DIRECTORSHIPS

Chairman, Task Force 200, Mobile, AL
Member, Board of Directors, Mobile Chamber of Commerce

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Q: Shall we start by talking about your family background? I am interested in such things as where and when you were born, where you grew up, the influence of being in a military family, and particularly the people and events that influenced you and your later career.

A: Well, that's a broad subject. My father was from Tennessee, and he came from a fairly large family.¹ They didn't have any money. The Civil War hadn't been over too long, and he found he could get an education by going to West Point. So that's why he went, solely for that. His first station in 1902 was Vancouver Barracks in Washington.

Q: Did he go into the Engineers?

A: No he was in artillery. In those days there was just artillery. At Vancouver he met a young lady, but she wasn't even old enough to think about getting married at the moment. But he stayed on it for a couple of years until she was old enough to think about getting married, and they married in 1904 when it was time for him to change station. They went first to Fort Warren in Wyoming and then to Fort Sill, Oklahoma, where old Geronimo was a prisoner.² My mother entertained her grandchildren with tales of Chief Geronimo and Fort Sill. If there was ever a time when you needed to quiet them down, all she had to do was sit down in a chair and start talking about Geronimo. Boy, she had them all enthralled, our kids and later the great-grandchildren also. Their third station was Fort Barrancas in Pensacola, and that's where I was born.

Q: How do you spell that?

A: B-A-R-R-A-N-C-A-S. And you just evidenced one of the problems of my early life. You know, going to school you had to write down the place you were born. I could never remember how to spell Barrancas. Today you could say Pensacola because Fort Barrancas has been engulfed by the Naval Air Station; but Barrancas, I didn't know. I left

there at the age of two, so you can imagine how much I remember.

But anyhow, I was born on the 26th of August 1906, and one month later went through my first hurricane, which was a doozer. Quite a few men were lost at Fort Barrancas and its satellite, Fort Pickens across the sound, during the hurricane. Bienville Square in downtown Mobile had some ships end up in it, so it was a pretty good little hurricane.

My father went from there to Fort Monroe. I vaguely remember living in the old fortress there. Then we went to Washington-I was about four I guess--and stayed there a couple of years. By this time he had chosen Coast Artillery when they split the two artilleries. He was in the Office of the Chief of Coast Artillery, and they decided they wanted him to write a training manual. But the old "Manchu law"³ would only permit you to stay so long in Washington at a time, so they made him the commanding officer of Fort Hunt, Virginia. Coming from Washington it is just short of Mount Vernon, right across the river from old Fort Washington. Fort Hunt was a one-battery post, a very modern one, with disappearing rifles. To me it's always amazing that I was living there in a place where we were defending the capital of the United States from enemy navies. They were going to shoot down the Potomac River and stop the invaders! It is amazing. And that's in my lifetime. I can remember Fort Hunt. Now it's a park under the National Park Service.

It became time for me to go to school while I was at Fort Hunt, and there wasn't any school. It was a little one-battery post with about five officers, counting the doctor. So I started school in post headquarters. The post bugler had the job of teaching me and a sergeant's son named Percy Hunt. The sergeant owned a farm adjacent to Fort Hunt, and his son and I were the only young ones around. And so the bugler taught us, concentrating on arithmetic, and my mother supplemented my schooling and taught me a little bit of English--spelling and grammar and writing. My brother Jack was born there in 1913, and then we went back to Washington.⁴ My father returned to the Chief of

Coast Artillery's office and continued to work there, and for the next eight years we continued to live all over northwest Washington.

I started formal schooling in Cook School in Washington in the third grade, so I was **probably** a little more than eight because I had to make **up** a grade later to get up to par. In 1916 we moved to **Park** Road and 16th Street to a tremendous big home that is now a fraternity house, I believe. My mother was distantly related to Congressman LaFollette from around Pullman, Washington, and he was related to Senator Bob LaFollette from Wisconsin, and we all lived together in this one house.⁵ I'm not quite sure what the arrangements were, but I believe there was a certain amount of credit given to my folks for running the place. **My** mother managed the servants and the kitchen and so on. That's probably how we could afford to live there. I don't know. But it was about a three-story house, and Senator LaFollette and Congressman LaFollette's kids, all of them, were very talented. One of the congressman's sons was a sculptor and painter and a violinist. He's now living just outside New York and he's continuing to teach violin.

But anyhow, we lived there two or three years. You **say**, "What's influenced me?" I don't know how much it influenced me, but at the table at night there were always 12, 14, or 15 people, and I was permitted to sit there if I kept my trap properly closed. We had a serving congressman and we had a serving senator. And this was right before World War I. And we had my father, who was involved **on** the military side, and they got some pretty hot arguments going. I'm pretty sure my father didn't agree with a lot of things Senator LaFollette was pushing for, but he admired his mind and his sincerity. It couldn't help but soak into me some.

Q: Do you remember LaFollette personally?

A: Oh, yes. And I remember another thing. My brother was going on two or three years old then. He was born in '13, so Chester LaFollette, the congressman's son I was talking about, was trying to make a head--I've got it upstairs in front of the mantel--a bas-relief head of my brother. He

got him to **pose by** putting up a stepladder, about a ten-step stepladder, and the little boy would climb **up** and down those steps, and Chester would be standing on his head and measuring. I didn't watch much, but you just couldn't miss it. It was a big studio on the top floor, and Jack and I played there frequently.

And then we **moved** from there to an apartment on Kalorama Road between Columbia Road and 18th Street. On Kalorama Road in those days, and all around us there, lived cabinet officers and other high-ranking people. I wasn't smart enough to get very impressed by it, but I have a friend named Keller, Chuck Keller,⁶ whose father was an Engineer officer, and was at the time the Engineer Commissioner of the District [of Columbia], and he remembers those celebrities who lived around us. Oh, **we** had a couple of the earliest motion picture child stars who lived around **somewhere near us**, and when you'd catch a streetcar you'd rub shoulders with those people. Anyhow it was interesting. We moved from there to another house **on Wyoming and Connecticut**, where from there I went to high school. **I was** supposed to go to Central, but I thought Western was much better, so I got special authority to go to Western. I rode a bicycle over to Western High School from Wyoming and Connecticut. I went into the high school cadets, and **sometimes** for formation of one kind or another I had to ride that bicycle with a rifle slung over my back. And it was a big old Craig Jorgensen rifle, a Spanish War type. It was as big as I was and kind of heavy.

In those days--talking about school problems--we had two shifts. I **had** to go to the afternoon shift as a freshman. I was there for two years in high school and my company won the high school competitive drill. This was one of the few times Western had ever done it. It was a great honor. And when President Harding was inaugurated, our company, as a reward for having won the **competitive** drill, was stationed right across the street from the White House as part of the honor guard. We didn't move, we just stood there carrying these heavy rifles. Then later we were taken in to shake hands with Harding in his office area. All this made a big impression on us.

Then in the summer of **1922** my father was ordered to Fort Rosecrans in San Diego as the commanding officer, and we went out there.⁷ By this time I was 16 and my brother then was **about 9**. I remember Fort Rosecrans was on a big cliff, a high bluff, with the beautiful clear blue water of San Diego Bay. We'd been used to going swimming up around New York harbor and the Jersey **beaches**, so nothing **would** do but we put on our bathing suits and ran down and dove off the pier. It was almost like the movies where they come right back out again. It was cold! We didn't realize how cold it was going to be.

But we had only been there about two or three months when the decision was made to close Fort Rosecrans, and my father was ordered to Hawaii. So we went to Hawaii, where he was the commanding officer of Fort Ruger, and I went to high school as a junior.⁸ I'm sure it must have been a heavy load on my family because it was a private school, Panahou, which was one of the oldest schools west of the Rocky Mountains. It was founded in 1841, and it's a very high-class school. They paid my way to the high school and my **brother's way to the** grammar school, and I wrangled them into letting me buy a car to get us to school. I was allowed to do that provided I would carry my brother. So I had a thing we called a fireless **cooker**. It leaked, so I used to go to the shops and borrow tools and get guidance, and I took an old FWD [four-wheel **drive**] radiator, a big old thing, and cut it down to fit the shell of the Dodge. It was fine except it still leaked, so the procedure was always to fill the radiator up just before going to school and fill it just before starting home. And the other thing, to be sure it would start, you always left it on a hill. But it worked fine. I went there for two years and graduated in **1924**. I told my father that I would like very much to go to West Point, and he said, "Well, we have got to get the appointment. Probably you'll have to take the presidential because we aren't going to be able to get a congressional appointment. Of course, that's pretty tough because there aren't very many."

Q: Why couldn't you get a congressional appointment?

A Well, we hadn't had **any** contact, except the congressman we had lived with, and he had been **defeated by** that time. I had a promise of an appointment from another who was related to somebody in my father's family, but when the time came he said for political reasons he couldn't afford to do it. That's fine. But anyhow our tour would be up in another year and my father promised to **send me to** an expensive school, a preparatory school in Washington I don't know, but it probably **cost** \$1,500 a year or something like that. In those days that was a lot. And so he said in the meantime I ought to go to the University of Hawaii and get a start. So I went and I **liked it.** As a matter of fact, I was a reasonably proficient tennis player. I'll show you the tennis cups I have. I haven't any golf prizes but a lot of tennis cups. But anyhow, I really wasn't very good, but I'd learned to keep getting the ball back. I entered the University of Hawaii handicap tournament and, since I was an unknown, they gave me a handicap of two. That meant I had **30** when the game started. I **did right well** against the first man I played, and the next one I played was the champion of the university. He was assessed a minus **30**, which meant if I could just hang on and win two out of the first six points, I'd win the game. So I beat him about six-love, and there was great furor about the weakness of the handicap system! But I had put him out of the tournament, and I was riding high.

That weekend I heard a rumor that there was an Army prep school for West Point out at Schofield Barracks **for enlisted men,⁹** and I thought, gee, you know, that might save my father a little money -and might even get me there a year sooner. so I asked him, "What about that? Could you get me in that school?" He said, "I don't know. I might be able to. But now think about it, I've promised to send you to a prep school in Washington next year, and it's not hurting you a bit to get this work at the university and get a little broader background." But he said, "It's up to you." And I said, "What would you advise me?" He said, "I'm not going to advise you. You ask any questions you want. I'll tell you the answers as I see them. But you've got to make up your own mind." And I spent a miserable weekend. I'd asked a lot of

questions, and I was trying to make up my mind. Finally, come Monday morning, I said, "Okay, I want to try it." So sure enough, he got me permission to attend the West Point Preparatory School for the Hawaiian Department at Schofield Barracks.

The Hawaiian Department was authorized¹⁴ vacancies for enlisted men to be appointed to the military academy as their quota, if they had 14 who could pass. Theoretically, there was competition, but in fact if they could just pass, they would get in. I found there was one other presidential, a boy whose father was stationed at Schofield Barracks, who was already going to the school, but he was living at home and going to school in civilian clothes. And then there was one National Guardsman who was attending. So I put on my ROTC uniform and lived in the 3d Engineers' quadrangle in the barracks of Company G of the First Gas Regiment. I think it cost my father the munificent sum of about \$11.90 a month for my ration. It was the total cost of going to school other than going back and forth to Fort Ruger on weekends.

I lived in the barracks along with the rest of the 50 or 60 men. The school had been going for two months when I joined them, and it wasn't too easy to catch up. By that time I had found out that there were probably about five presidential appointments available for the whole United States that year, and here was one guy right there in the same school with me, and it looked like he was going to beat me out. So things didn't look too bright. But I decided I had to work. We had two squad rooms, one for study and one for sleeping. Many of these enlisted personnel had not finished high school. They were working pretty hard, working until one, two, or three in the morning, and I was staying with them. But I found myself falling asleep in class, and since we had three brand new second lieutenants, recent graduates of the military academy, assigned as our instructors, I came to the conclusion that if the Army was going to furnish these people and use up their whole time, it behooved me to listen to what they had to say. So I decided I was just going to go to sleep at a certain time every night and not fall asleep in class. well, as a result, about 11 o'clock, I went back to the squad room and crawled into bed

and went to sleep. And about two or three in the morning, when the other ones would come drifting in to go to bed, they'd look over and say, "Look at that damn weary Wilson over there sound asleep and here I am working." As a result I became known as "Weary" Wilson, and I've carried that ever since then.

Q: I was going to ask you about the origin of your nickname.

A: Well, that's how it started. And I might say that I found it had some advantages. There are lots of Wilsons in the world--there were 14 Cadet Wilsons when I entered the military academy and two W. Wilsons in the plebes of my company. Also, when a commanding officer gets word that a Wilson has been assigned to him and finds he's known as "Weary" Wilson, he expects the worst. So anything I could accomplish made a great impression!

Q: To get back to Schofield Barracks--

A: The school was very good. They worked hard on you, and every Saturday we went through **a portion of a prior-year** West Point entrance exam. Some Saturday mornings we'd do the English portion, the next Saturday morning we'd do part of the math portion, the next one part of the history, and so on. And just every **Saturday** morning you went through the routine of getting there and starting when the bell rang and you started work. When the time was up, the bell rang and you stopped work, and it was just kind of ground into you. And, as I say, I got impressed with the fact that my chances **were pretty dim**. In English, I thought well, there's one thing I can do something about. I had a good high school teacher in English at Punahou. So I went back to her and asked her if I could write themes every week and bring them to her on the weekend and get her to correct them, and then I'd copy them over and then do it again and again. The net effect was that I had about six themes memorized, punctuation and everything. And out of those six I got to use about three of them. I'd guessed well enough so that most everything I turned in in English was along the lines of what I pretty well had suspected.

Of course, I memorized history, my gosh it was coming out my ears! As I understand it--I don't know this for a fact--I ended up that year as number one in the five presidentials that got appointed, in spite of the fact that this kid that was right there had been beating me all year.¹⁰ And as a matter of fact, he turned out to be the number one boy in my class when we graduated from the military academy, too. I've never tried to confirm it or anything, but I do know that there were only five, and I was one of them.

Q: Five in the entire United States?

A: Yes .

Q: So actually there were two presidentials from the same school?

A: Two from the same little group. The only two trying for presidentials in that school both made it. There **were only** three others in the rest of the country. I didn't know how impressive that was then, but I do now. But also the National Guardsman made it and 14 enlisted men; their total allotment passed and entered the military academy the first of July. Some of them dropped out pretty soon, different things happened, but quite a few of them made it all the way through. As a matter of fact, the company commander of my company, A Company, our first-class year; was a first sergeant at the time of the school. He was a young man, they didn't have them in those days that young, but he had made it. He hadn't finished high school, but he was an outstanding member of my class. The **poor guy got** killed in a flying training accident very shortly after graduation.

I **used to drive home** every Saturday afternoon after we completed this prior[-year] West Point exam, go to Fort Ruger, fall asleep at home, and eat. Eat mainly. And I did sneak over to the officers' club **at** Schofield Barracks **once** in a while during the week and eat. Then I'd go write the theme on Sunday and take it by and see my former teacher. Then Sunday night or early Monday morning at the crack of dawn, I'd drive back to Schofield Barracks. It was about a four-hour drive in those days. After we completed the entrance exams and

the regular preparatory part was over, those of us who the instructors thought had probably made it were permitted to stay and take advanced work to be sure we had a good start when we got to West Point. We didn't know whether I had made it or not when we left Hawaii. We were going back by way of my grandparents' place out in Vancouver, Washington, and I got word there to report to the military academy.

So I got on a train out in Portland, and on that same train was this National Guard guy that had been in Schofield Barracks. Another man on the train was a grown man as far as I was concerned. I called him "sir." The last night on the train, as we were going down the Hudson River and I was getting ready to crawl in my berth, this guy sat across from me and said, "Well, I've listened to you all talk about West Point. I'm going there, too." I was amazed. I thought he was past the age limit, and he turned out to be a real fine classmate and ultimately our class president. He had graduated from the University of Oregon already. He also dove a fighter plane into the ground. It didn't help him, but he did right well.

Q: You often hear that if you are an Army officer's son, an Army brat, that it's sort of decided that you are going to have a career in the Army. That doesn't sound at all like your experience. It seems like you were the one who was pushing for West Point.

A: I was made to make the decision and my brother pretty much the same way. He graduated in the class of '35 at the military academy. It was our idea, I think. We weren't pushed into it, I agree. I saw boys up there who were. We've tried to learn from that. I know with our kids, one of mine wanted to go to West Point.¹¹ We had a tough time getting him in and an even worse time keeping him in. But he has made it. He graduated near the bottom of his class, transferred to the Engineers, and later became the deputy district engineer in Louisville. He has done very well in school ever since then. The other one [Frederick], we kind of hoped that he would want to go to West Point, too. He didn't much care. He thought civilian school was much better. But he thought

he'd try, so he got an appointment and a chance to take the exam. He was shocked to discover that he not only didn't come out number one, he didn't come out! When we were at Fort Belvoir, he was in high school there in Virginia. He did so poorly his sophomore year that I said, "Freddie, what in the world can I do with you? What's going to happen?" He said, "I don't really know. I think you have got a problem. But why don't you send me to a military school?" That was his choice. I said, "Well, you pick it, and I'll try and get you in." It was then June, **and** it was too late to get in most of them. But he went and looked at two or three and came back and said, "I want to go to Staunton Military Academy down in the **valley**." And we called them and went down there, and they took pity on the fact that here I was a rather high-ranking officer and we needed to get him into something. So they took him. And we agreed that he was going to repeat his sophomore year. He didn't do too well the end of that second sophomore year, but it was an improvement. But at the end of his junior year he was selected as one of the two battalion commanders for his senior year, about the third-ranking officer, and his academic work improved, and then's when we retired. He had to decide whether to go back to Staunton and get all the perquisites, all this he had earned, or come down here to Mobile. I told him if he came down here, he had to go to this little tin school down here called UMS, University Military School. Incidentally, it's no longer a military school. He said, "Well, why do **I** have to do that?" I said, "Because it's the best academically. You've gone through your first nine lives on academics, let's don't walk into another trap." This was not from the military part of it, strictly the academic. so he graduated. By the time he graduated from high school he wanted to get married. We told him that was up to him, but we had a session out while I was weeding one day, and I explained that when he **got** married he was then a man and that was the end of my payroll as far as I was concerned. That shook him. So he said, "All right, then I'm going to enlist in the Army and get that over with and then come back and on the GI Bill. I can do it." And I said, "Well, that's your prerogative."

So one day in early September 1966, his girl, a nice little girl, had arranged for a farewell party right down here in this room--this incidentally was his suite, he had four doors he could get in and out of without us knowing it. She had a big cake baked with "Farewell Freddie" and all this stuff, and he had arranged with the recruiting people to show up the next morning. That afternoon, I was again weeding, and he came out and squatted down, didn't do much weeding, but he started talking, and he said, "I think maybe you were right." "Well," I said. "I'm glad to know that. What do you mean?" He said, "I think you were right when you told me that I would be better off graduating. I could go to college, get a reserve commission, go in 'the Army then, and be of more value than I will be if I go in right now. But now what can I do? I've got this party tonight, a farewell." I said, "Well, go have the party. Let everybody have fun, and when you get through say, 'Well, I've chickened out. I've changed my mind, I'm not going.' And just tell them that." And so he said, "Okay."

He wanted to go to Tulane, he wanted to go to Georgia Tech, he wanted to go [to] all these places. None of them would accept him, and so he continued out here at South Alabama. It [the school] had been going just about two years by that time. He said, "I'm going to finish college in three years and catch up. I'm going to get married by the time I graduate." I said, "You've set the goals/' And that's exactly what he did. Because of two years at Staunton, he got credit for one year of advanced ROTC. He had three years of advanced ROTC, so he had the full four years of that. He got his degree in three years from college. He not only did that, but he worked at McDonald's and places like that to make money in the meantime. He got married the night before graduation, went on a one-night honeymoon, came back, and graduated, and then went on a honeymoon to Fort Benning--they had two weeks to get there--and he's a regular Army officer. I say all this because again I was glad he did it, but I think I had learned from my father not to try and force him to go in.

Q: Do you have other children?

A: Two daughters.

Q: Now to get back, what year did you start at West Point?

A: July 1, 1925.

Q: When you started at West Point, were you interested in going into the Engineers?

A: Not in the slightest. No, as a matter of fact, I was somewhat immature. I went to my high school graduation dance and ate the cake and punch and stood around on the outside looking. I didn't know what you were supposed to do with girls. It bothered me when I got near them. I was really a little boy. I had a little trouble gaining enough weight to meet the requirements to get in the military academy. This National Guard boy and I, Ted Barber, had both eaten bananas before we stepped on the scale.¹² The doctor came by and took a look and said, "Can't you scrunch down a little?" So we both did, and he got a pitcher of water and said, "Here, drink that son." So I drank a whole pitcher of water and he said, "Well, I guess you make it." We were on the ragged edge of being underweight, about 140, and I was over six foot. But during plebe year I went up to about 175--the year that's supposed to be the toughest. As a matter of fact, all the uniforms they had made for me were tight by the end of plebe year. I discovered some of the other facts of life along about Christmas, plebe year, when everybody went home except the plebes. And I had a gorgeous time. Girls came up. What a lot of fun it was! But I was not what I would call mature even by that time.

As far as Engineers, no. My thought was artillery, field artillery. Now when they put you in class right at the start, they put you in alphabetically. So being a "W," I was in the last section for everything. And I found out to my horror that they graded you on that. I mean instinctively. If you were in the last section, you really had to demonstrate that you knew the subject. I found out later in the year that if you could get in the first section you were considered to be pretty smart and you had to prove you

weren't! But anyhow, after that first month in the last section I was deficient in at least one subject and some upperclassmen came to my room to buck me up. They stood me against the wall and really convinced me that it was time to go to work.

Fortunately, after a month, the sections were readjusted, and I sought my own level. After a while things were a little easier. I worked pretty hard that first year. I ran scared. As a matter of fact I ran scared enough to rank number five at the end of plebe year. But from then on, I doubled my standing each year. If there had been a five-year course, I might not have made the Engineers. I think I was 5 the first year, 10 the second, about 20-something the third, and about 40-something the fourth. But putting them all together I think I was 19th in class standing. I had quit running scared by then. I talked to my father about it on one occasion, and he said, "Well, you know, it's easy to get out of the Engineers but it's pretty hard to get in." He said, "If you earn it, why don't you try it? You **may** find you like it very much."

I decided to take his advice. So I didn't start with a goal of being an Engineer, it just seemed logical to try it since I had earned it. And I've never regretted it since. I had some classmates who spent a lot of time coaching other cadets. I coached some each year at turnout exams. I had to keep studying, but I didn't take it quite as seriously as I had earlier.

Q: What were your impressions of West Point in the mid--twenties?

A: Well, I'm probably pretty naive, but I thought it was fine. Looking at it afterwards, there really weren't any worse times. Most of what we talk about at reunions and have fun kidding about and thinking back on were what seemed terrible at the time they happened. When you think about them afterwards, there were reasons for them, or they really weren't too tough. I didn't try very hard for cadet military rank and as a matter of fact I felt a great deal of pride in being an area bird, one of those guys that had to walk punishment tours on the area. Twice I was busted from a cadet rank,

and this didn't bother me in the slightest. Fortunately, my other two roommates and I, who lived together most of the four years, are all alive. It's the oddball things that we think about when we get together for reunions.

I didn't always live up to the rules. I mean by that I got caught on some. As an example, I told you my uniforms were getting too tight. In those days you didn't have a leave until you had **been** there a year--and-a-half, and then at the end of two years you had a two-and-a-half months' furlough. When I came back from that two-and-a-half months' furlough, nothing fit, and I was too tight to go and buy a whole new bunch of uniforms. So I kept having the cadet store put a larger collar on a blouse, or something like that, and I got by pretty well. But the first time we put on overcoats that fall was to go to chapel, and when I put on my FD [full dress] coat with brass buttons on the collar and then tried to hook the collar in my overcoat, it was no longer possible. And I thought, oh boy. I was a corporal at the time, and I went to the formation with my overcoat collar unhooked. Nobody noticed it. I rushed up to the cadet store the next Monday and said, "Need a new collar on my overcoat right away." And they said, "We can't. We're taking care of all the plebes. They don't have all their overcoats and everything yet. So you must wait."

Well, I figured out that for formations I could just go with nothing under my overcoat, and it would be just fine. Nobody would ever notice it. But then they announced that we were going to wear full-dress coats to the Notre Dame football game in New York. It had never happened while I was there. And that was too much, putting those brass buttons and all on. I couldn't get my coat collar closed, and this would show up for sure in Yankee Stadium. so I thought about it awhile, and I finally went to a classmate who was the next year's football captain and asked would he carry my full-dress coat down to his room at the Astor. He said, "Sure." So I sent off my full-dress coat with the team on Friday morning and figured I'd just wear my overcoat until after the game and go to the Astor and get my blouse. It was a fine idea except others had thought similar thoughts, and so

there came an announcement at noon that cadets will wear full-dress coats. My FD coat was already en route to the Astor.

Saturday morning, when we fell into ranks, the company commander said, "All right, there will be a 10-minute break now. Anyone who doesn't have his full-dress coat on, fall out and go get it **and put it on.**" I stood there. There wasn't anything else to do. Mine was in New York City. So I mounted the train and sat in that heavy thing, sweat pouring off of me. I went in the little boys' **room** once or twice, took things off and panted, but nobody ever saw me out of uniform. I went through the game and went down to the Astor and put on **my** FD coat. I was never seen improperly dressed, except as to overcoat collar hooked, but Monday morning there was the skin sheet on the bulletin board for failing to wear an FD coat, and I was in trouble. So I reported to the battalion board, consisting of three senior officers--Bradley was one of them--to explain.¹³ I gave them my little explanation, and they said, "Well, that didn't sound very smart." "No, sir," I said, "it doesn't now either to me." But, I said, "Here I am. I couldn't get my coat fixed. The cadet store couldn't handle it." They said, "Did you go talk to your tactical officer?" I said, "To my tactical officer?" They said, "Yes, he'd have helped you." "Well, I never thought of anything like that, I'd never expect a tactical officer to help me. All I would expect him to do was skin me.' That finished it.

For the rest of the month of November and December I kept waiting for the axe to fall. Finally I wrote **home and said**, "I won't be home for Christmas. Don't kill the fatted calf." But about three days before Christmas leave, they read them out in the mess hall and had busted me and given me 21 hours but no confinement, so I was able to go on Christmas leave anyhow. But I had to come back and walk 21 hours in the snow and the cold, every Saturday and Wednesday: 3 **on** Saturday and 2 **on** Wednesday.

No, I wasn't too impressed. I got to be a first sergeant, but I believe that was solely because the company tactical officer had the right to name his

own **first** sergeant, because I don't believe I earned it. But I learned an awful lot by being the company first sergeant. I learned how to get people moving. and keep them edging in the right direction and **avoiding** any direct confrontations, just kind of ease them around and keep them on their toes. It was good experience, no doubt about it.

As far as I'm concerned, I like West Point. I knew what I was getting into. I never was asked to do anything that was beyond what I could expect to do. Oh it was regimented and some people say you didn't have enough freedom of choice and all of this. That didn't bother me. I didn't know enough to get bothered.

Q: You've mentioned classmates but not by name. Were **there any** of **your** classmates who went on to greater distinction like yourself?

A: Oh, a whole lot of **them**, many of them.

Q: Well, who were your closest associates?

A: My closest associates were the ones **in the** same company. Ed Lasher was one.¹⁴ He went into QM [Quartermaster] construction and then the Transportation Corps and retired as a major general and went to Chicago and took on the job of president of a big company. He made a jillion dollars and made his company very successful. Another roommate, [James J. Winn], was a colonel, a real good one.¹⁵ He married General Marshall's stepdaughter. He never got any advantage out of that. He's just the opposite. He's well off, he's doing well, and is very well respected. We've got quite a few that were three- and four-star generals. Frank Merrill of Merrill's Marauders was a classmate of mine.¹⁶ Actually he was a roommate with me out in New Delhi at the time he got appointed to that position. The man who really earned it was another classmate named Ruby Hunter, who got very little credit, but he did the organization and training of that outfit and then got more or less submerged.¹⁷ There's Freddie Smith in the Air Force.¹⁸ Oh, there's a lot of them. Jimmy Gavin, Paul Harkins, Bozo McKee, Bob Ward, Al Viney, Jack Person, Paul Freeman -too many to list.¹⁹



West Point Roommates. Walter K. Wilson, Jr., reunited in 1958 with West Point roommates Colonel James J. Winn, III (c.) and Major General Edmund C.R. Lasher

Any number of three and four-star generals were classmates. I'd have to get out a list and look. The system can't have been so wrong and produce as many of them as it did that did well, in my opinion.

Q: What about professors at the military academy who particularly influenced you?

A: Oh, I was going to say, we had one classmate, Abe Lincoln, "Big Abe" we called him, although he was "little Abe."²⁰ "Big Abe" was the older of the Lincoln brothers and he was a professor at the military academy. He was a general during World War II. I was a general briefly also during World War II. Abe went up to the military academy as a professor. He got to be a confidant of presidents and [to] the State Department and other things.

My father had a classmate up there named. Mitchell, who was professor of engineering.²¹ I went back up there as an instructor later and worked for him. There were some fine men as professors in those days. Bradley was in the tactical department--battalion tactical officer if I remember correctly--and he was on the "bat board." Yes, the three battalion senior tactical officers formed the bat board. They reviewed the disciplinary actions and recommended to the commandant. But there were some fine people there. They influenced us, there's no question about it. One thing that old Professor Mitchell used to say that impressed me, not only as a cadet, but later when I became an instructor, was "Do something! Don't just sit there floundering. Analyze it, decide what you can do and do it. Zoom!" And he actually told us when we were grading engineering papers that if you get one from a cadet that says, "I don't know how to do this problem, but here's something I do know how to do," give him pretty close to a passing grade anyway, if not passing. It depends on how difficult a problem he's chosen to put down. To me a poor decision well carried out is better than a brilliant decision poorly carried out, and that's in essence what he was saying. And I think that's been true the rest of my life. I've noticed that it's how much drive and attention and staying power you put out that really produces the accomplishment in the long run. I don't mean you shouldn't have some

brilliant people planning on it, but it's the execution as well as the thought behind it that makes it work.

Q: How did you find the curriculum at West Point?

A: Everything was a challenge to me. I don't think we in those days were nearly as analytical as the student of today. I mean, as far as I was concerned, whatever they threw at us was something I had to do. There weren't any ifs, ands, or buts about it. I didn't spend hours looking further into subjects very often. There wasn't near the emphasis on library research and all that kind of business that later times brought along. But I think we had people come out of it that have done a right good job of what they were intended to do.

Q: If you would like, could you comment on recent problems at West Point?

A: I don't think there is any particular thing I can add to the honor system problem or silencing. I'll put it this way. I went through an episode of silencing as a brand new yearling, a sophomore in other words, just after the plebe year. There were some people in the class ahead accused of honor violations who were kept back from furlough and did duty with us. And I went through a horrible period of time when we were pulling targets for another company. This joker and I were on the same target. Here we were, and I wasn't supposed to talk to him. I couldn't help but sympathize with the poor devil. His grandfather and great-grandfather had been heroes back in the Civil War and earlier days. Whatever he was accused of, I didn't know. But it seemed to me they were putting him through hell, and it also made it hard on us because we were trying to live by the code, and you just didn't say anything to him. So here you are pulling targets, and you could point to the place, but you didn't talk. That's a minor thing now.

I was impressed with the honor code as we knew it. I had classmates turn themselves in, not for real crucial things, but where they had inadvertently given an "all right," which is the same as saying, "I'm doing something proper, and it's authorized."

And after thinking about it awhile, they decided they really had to turn themselves in, and they walked for two or three months as a result. They didn't use it for discipline in those days. It was more for honor.

Now, I think as they got bigger and bigger and bigger, the honor system and the disciplinary system got married to a degree. When I was there as an instructor or when I was **there as a cadet**, **they would never have put us** in a position where it was easy to find out from another **battalion** **what was going** on before you did it. The time interval was such that you would have **to really go out of your way and obviously** be trying to cheat in order to do it. I coached my two roommates when they were yearlings, one of them in analytical geometry and the other one in descriptive geometry. One of them could do one and couldn't do the other, and vice versa. I could get by in both subjects. So every night I **worked like the devil** on one, and the other the next night. I didn't know what was going to be asked because I was taking the work at the same time they were. I was able to outguess it on occasion. But they never set it up in such a manner that what you turned in today was what somebody else was going to do tomorrow or something like that. To some extent, I think it was the fault of the administration to let it reach that point.

I'll **put it another** way. they never played cat and mouse. They never set up a situation that I can remember that would tend **to** lead to want to do a little cheating.

As first classmen, **two** other classmates and I decided we were going to live **high, wide**, and handsome. So from Pinky, the enlisted-man mail carrier, we bought a secondhand car, a little Studebaker. That was outside the rules. If anyone in authority had asked us if we had a car, we'd have said yes and that would have been it. But we carefully kept it down in Highland Falls, and when we went on weekend leave we'd get in a taxi, ride to Highland Falls, get our car, and take off. Once you were off the post you were entitled to drive. This was fine except one of the three of us was getting **enough demerits each month so** that he never earned any leave. So he never got to use that car.

At Christmas two of us went off in the car and visited a classmate in Philadelphia and then went to Washington, where we stayed with my mother and father. We had a gay old time, and Washington was a great town for cadets in those days. They had tea dances and debutante parties, and it didn't cost you anything except to wear a uniform. Cadets didn't have money in those days to amount to anything. The poor third guy showed up in Washington for his turn about three days before Christmas leave was over. Well, by that time we were well fixed up with dates, so he ended up sitting in the rumble seat. He finally behaved the month of April so that he got leave in May, and we both said, "It's your turn. You have the car. We're not going to interfere." And I looked out the window of the barracks, and there was this cluck striding across the area of barracks and climbing into the car, right there. He took off.

The guard at the south gate tried to stop him, and he just waved at him and kept on going. He went off and had a fine weekend. He came back, and Sunday night he showed up in my room and handed me a dollar and said, "You're selling me your part of the car. Here's a dollar." I said, "I'm not selling it to you for a dollar." He said, "You're selling me your part of the car for a dollar, you better take it." I said, "Okay." So the next morning when they called him up and said, "Who owns that car?" he said, "I do." They didn't ever ask any more than that.....So..he...was..in confinement and walking tours right up until the morning of graduation. They took the car away and hauled it out to the post garage till graduation* I bought back their shares of the car and that was my first automobile after being commissioned.

To answer your question, really I think it's too bad if they don't have a good honor system. It's too bad if they run it in[to] the ground and make it a disciplinary tool. The less the system involves, the better it is. We had honor representatives in the company, but I don't remember wanting to ask them something because it was relatively simple. You knew it was either yes or no, so you didn't have any problem.

Q: Can you tell me a little about your graduate work at Berkeley? What you specialized in?

A• Well, we haven't gotten me to Mobile District yet. I graduated in June and reported to the Mobile District in September. This was my first assignment, right here.

I arrived here in September 1929. I was known as a student officer in those days. The idea was to spread you around and let you get a smattering of experience with everything in the District. Interestingly enough, in the summer of 1929 I spent weekends at West Point, my mother and father being stationed there. I worked for the "Delay, Linger, and Wait" Railroad, The Delaware, Lackawanna, and Western, the summer of graduation, and this started me off to financial success because I got \$125 or \$140 a month for two months. I lived in my aunt's house out in New Jersey with nobody else there, they left me in the house. Because I was working for the railroad I had a pass, so I rode free back and forth to Hoboken, where the office was. So I'd come home every night, nobody else around, and I'd take in another girl and another nightclub, or roadhouse or something every night.. I lived on one salary and put the other one away. I was really just doing fine. I went up to West Point nearly every weekend because I could go to the cadet dances and late date the best looking girls. That happened to me when I was a cadet, and I was enjoying getting it back.

On one occasion I ran into a friend of mine **from** the same company who had been a class behind me and found out he was being suspended for a year. He had gotten drunk on a Philadelphia trip for the ordnance. I said, "**Well**, what are you going to do?" He said, "I don't know, I've got to do something. I have no means of support." I said, "Why don't you come with me? I'm going to the Mobile District. There's only one officer down there, and I'll be the second officer, so I'll be a big shot. You come on, and I'll get you a job." He said, "Do you really mean it?" I said, "Sure." He said, "Fine, I'll do it." So when I left that weekend to go back and get ready to report to the Mobile District, I took this boy with me, Jerry Williams, and we drove down in that same little Studebaker.²²

On the way I told him, "We ought to go by Eufala, because there are a couple of girls there, one family with five gorgeous babes in it, we ought **to go** by there and let **me** show you what there is in that part of the world.' I had been there visiting my Alabama roommate right after graduation and had met one of these girls. So we went by that way, stopped in Eufala, intending to spend one night. We enjoyed it, so we stayed a couple of nights. Then we blew out a tire, which took all our money. We started off for Mobile, one day late, from Eufala, Alabama, driving across country. We figured that nobody in the Mobile District office would know whether we were late or not because nobody would pay any attention on Sunday. We pulled in here Sunday night. They had just built the Cochran Bridge, and it was \$1.25 toll. When we got to that darn bridge, we had \$1.50 between us and we hadn't eaten any lunch to economize, and we just had enough gas to dribble into town. We tried our best to talk our way through that place, and we said we were going to go around. The man said, "Well, **you** can if you want to, but it will cost you more for gas than \$1.25." So we paid him.

We didn't have sense enough to **go** to the biggest hotel and just check in and sign for dinner. We looked for the crummiest boardinghouse we could find, and because we had so many pieces of baggage, the woman let us in there without making us pay in advance. I said, "Well, we'll go look up this District Engineer [Lt. Col. William D.A. Anderson], because he knew my father, and maybe his wife will invite us in to eat supper."²³ So we went out and sat in front of that house for three or four hours, and they were away for the weekend. So we ended up spending our quarter for one milkshake, which we split.

The next morning we reported to the District office the minute the doors opened. I'd never met this man, and he'd never met me. He said, "Is there anything we can **do** for you now?" I said, "Yes, sir, you can introduce us to the bank so we can get a check cashed. We haven't eaten for over 24 hours." Well, he took care of that. I told him I had Jerry Williams with me, and I thought he might be able to find a job. He had to go back a year later. I did a pretty good job because this was on

a Monday morning and by Wednesday morning Jerry Williams and I were both in Jasper, Alabama, ax in hand, cutting line for a survey party. We both had the same job! That was extremely interesting. I enjoyed it. I went from ax man to rod man to instrument man to chief of the party in two months. He went a little slower, but **not too much.**

Then I got sent back to the District office to work on the notes from the surveying. I got back here about the first of November, and I had taken the advice of the District Engineer to board with Mama Leatherbury, who headed a large, socially prominent family here, hit by the loss of the husband and the Depression and living in a big old house on Government Street. They were taking in boarders to exist, and they let me come in. It was a smart move socially. You had it made once you got in there. I got invited to the Bachelor's Ball at the country club, where I found out they had all the **girls lined up around** the wall and all the **men are** supposed to come by and shake hands with them. Of course, everybody in the place knew each other except me. I didn't know a soul, and I soon got awful tired of explaining who I was as I went around. So finally, I just said, "I'm Mr. Smith."

When I got to where Jeanne Herman was standing--she was in the line and had just graduated from the University of Alabama and had come down here to teach school--I was Mr. Smith. I always say that she thought I was one of the Smith Bakery people here in town, and that's why she chased me so hard! We hit it off pretty well. I got sent back up to the Birmingham area to inspect on an aerial survey job, but I came back down along about the middle of January, and we got ourselves engaged one night. The next day a delegation visited me and asked if I would be a knight in the Mardi Gras. The friend of one of the maids was from out of town, and he couldn't make it. If I would do it, I would have no expenses, all my requirements would be taken care of. I thought this was something **to avoid and** that the District Engineer would never let me do it, so I said, I'll be glad to do it if the District Engineer wants me to." I went in and reported to him and he said, "My goodness, that's the best advertisement this District has ever had! Go ahead and do it." Then I had to explain to my

fiancee. She said, "Well, if we let it be known we're engaged, neither one of us will get invited to many things, but if we don't, I'll get a lot of invitations, and you as a member of the Court will go to everything. So let's go ahead, let's don't say anything." I said, "I've got to tell the girl." She said, "Sure." So I told my maid before I accepted that I really was engaged to another lady. She knew Jeanne, and she said, "If she doesn't mind, I will be happy because my long-range plans include the man who can't come." So I was a knight in the Mardi Gras in 1930 here in Mobile. I had a heck of a good time.

Then I got stationed around at all kinds of jobs. I lived at the shipyards in Pascagoula for a couple of weeks learning to weld. They let me put a cot up in a sail loft to save money. I also lived on a dredge, the dredge Wahalak, out of Gulfport, and I did every job [for] three days. One day standing around watching and being told what to do; the next day doing it with someone standing around watching and telling me if I did something wrong: the third day they just walked off and left me. I was an oiler, and a fireman, and a deckhand, and a dredge runner, and a steward, and the captain on that basis. It just happened that my bride-to-be was staying down at Biloxi with her family, so every time I had any time off, I took off and went in and spent it with her, slept on her porch, and then came back. I had it down pretty good for a while there. I found out if I worked eight hours, then eight hours more, and then slept eight hours, and then worked one more shift, I could be gone about a full day-and-a-half. But it kind of got to me after awhile on the sleeping. But it worked out.

Later that year, in September, I was ordered to Fort Benning. We agreed that we'd get married after I got to Benning, had quarters, was oriented in my outfit, and so on. So I reported to Benning in early September 1930. I reported to the 7th Engineers, which was a regiment, only it was a regiment minus everything but the first platoon of A Company. So we actually had about 35 enlisted men and two officers. was the second officer, and First Lieutenant Ben Fowlkes was the commander.²⁴ That was the demonstration unit from the Engineer viewpoint for the infantry

school. It was extremely interesting because it was a little bit off by itself. Nobody bothered with it too much. We did what Ben Fowlkes thought it was a good idea to do. If the post needed something done, the post executive officer usually called up and asked us if we could do it and if we should do it, and we'd say yes or no and they'd let it go at that.

I got quarters and then we set up the wedding, and I took six classmates of mine from Benning with me for the wedding in Tuscaloosa, including my four-year roommate as my best man, and four groomsmen and a spare. We married on October 4, 1930, and then went on back to Benning after a honeymoon at West Point. My bride had never been near the Army until that stage and she started learning things beginning right then, and learning fast.

A year later I became the commanding officer of the 7th Engineer Regiment. In those days the Chief of Engineers put out a book listing the regiments and their commanders. There was "7th Engineers, Second Lieutenant Walter K. Wilson, commanding." This came out about every three to six months. And each time a new issue came out, I'd get a letter from a reserve officer somewhere up in Ohio stating that I was falsely occupying that position, that he was the commanding officer of the 7th Engineer Regiment. I said, "Well, you write that to the Chief of Engineers because I don't care." Nothing ever happened, but that went on and on. I don't know what it was really about. But it was really just a platoon. That's what it amounted to. I had been commanding officer alone for a couple of months when the post executive officer called me in and said, "Weary, have **you** got a lieutenant reporting to you today?" I said, "I don't know, sir." He said, "Well, I think you must have." I said, "Well, how do you know he's for me?" "Well," he said, "there's a young man with castles on, dressed to the hilt with his boots shined and his yellow gloves on, **and** he's wandering around up here at headquarters. Come up and rescue him. He doesn't know what to do with himself." So I went up there, and it was Steve Hanmer, a future major general in the Corps of Engineers.²⁵ Steve showed up and he was green. He'd just washed out

of flying school, and I remember I thought well what did Benny Fowlkes do with me the first day I arrived?

I said, "Lieutenant Hanmer is going to handle the infantry drill today. You and I'll stay in here." So the first sergeant and I stood there peeking out the window. If there was one thing we could do with a little bitty 35-man platoon, it was to do a reasonably passable job of doughboy drill. But within two or three minutes we looked out and it looked like a horde. It was all screwed up. said to Sergeant McCarthy, "What in the world's going on, can you tell?" He said, "No, sir, I don't know, I don't understand it." So I went out to just watch. I stood where I could listen. And poor Steve, he had gotten excited or something, I don't know what, but he wasn't saying "Squads right, march" or "About face/' he was saying, "Squads-right-march, about-face" very fast, and the troops weren't used to that. So it got a little bit off the timing. I finally signaled for him to call a halt and give them a rest. I said, "Now look, this is your drill, and I'm not going to tell you how you have got to do it, but don't you remember as a cadet the cadence they used? Squads right, march." He said, "Oh, yes, thank you." So then he went back to his doughboy drill.

Once we were asked if we could go out and repair a lot of the culverts and bridges on the trails running all around the place. Fort Benning was the largest military reservation in the U.S. at that time. It was a big station. This was just down our alley. We lined everything up and started out. We had one FWD truck, one motorcycle with a sidecar, and some mule-drawn wagons--that was our road equipment in those days. And we marched out and built several bridges and bivouacked.

One day about noon a Private[F. Kingdon] Schaefer came to me and said, "I want you to see what I have." He pulled out a great big long snakeskin. He'd skinned a rattlesnake. I said, "Why did you do that?" "Oh," he said, "I think they're wonderful." I said, "Don't you know that the mate will find **you** out sometime and **get** even with **you**? Well, we went on another couple of miles to another place and started working and then decided to



Mrs. Walter K. Wilson, Jr., in 1931 with Stephen R. Hamner (l.) and her husband (r.), both lieutenants.

bivouac for the night. The first sergeant came up to me and said, "You know, we're not anywhere near the main post. Nobody's going to come out here and look at us. Do we have to line up a company street with pup tents and all, or can we just let them roll up wherever they want to?" I said, "Sergeant, I think you have got a good idea. Let's just let everybody roll up where they want to." So in the middle of the night, about midnight, I heard a terrible shriek. I came up out of my blanket and wondered where it was. Flashlights started focusing on one place. I ran over, and there was Private Schaefer holding his leg. Sure enough he had three penetrations forming a triangle like I remembered a rattlesnake bite to be. I didn't know what to do. So I said quickly, "Does anybody know what you do with something like this besides put on a tourniquet?" We immediately started somebody putting on a tourniquet. I said, "What do we do now? Does anybody know?" By this time Hanmer was there and most of the platoon. Nobody said a word. From my Boy Scout days I remembered you were supposed to get a razorblade and make a cross-hatch cut. I asked, "Does anybody know any better?" No answer. so I said, "Somebody give me a razorblade." Somebody handed me a razorblade, and I said, "Who's going to do it?" No answer, so I said, "Three of you, hold his legs." I made two fairly deep cuts and said I remembered from Boy Scout days that we are supposed to suck out the blood and poison. So I leaned over and started sucking away. After two or three minutes of sucking and spitting, Steve Hanmer tapped me on the shoulder and said, "I'll take my turn now." So I moved over and let him suck awhile. In the meantime we had the truck warmed up to send him back in to the post hospital. We sent a man along to loosen the tourniquet every so often, and then we went on back to sleep. We knew it was about a 45 minutes-to-an-hour's trip to the hospital, so we couldn't know whether he was going to make it or not.

Just before daylight there came a racket and hollering, "Who's the commanding officer of this horde?" And I ran up and said, "I am." It was a medical officer and he said, "Did you send a man in with a snakebite?". "Yes, sir. Is he going to live?" "Well," he said, "that's not my question

now. Did somebody suck the blood?" "Yes, sir," I said, "I did." He opened my mouth up and looked in and felt all around and then shut it. "Did anybody else," he said. "yes, sir. Lieutenant Hanmer." So he repeated the process on Steve. He said, "You're both lucky. You know if you'd have had any cut or a scratch or opening of any kind in your mouth, you would both be dead from the venom." I said, "Can you tell us how Private Schaefer is?" He said, "Well, actually, you saved his life. Why did you do that? Where's the snake kit you're supposed to carry?" I'd never heard of a snake kit. So we soft-pedaled this tale when we later returned to the post. The less said the better. But Private Schaefer returned to the company in about three weeks. About six months later, his father came on a visit. Schaefer brought his father in to meet me, and his father thanked me very much for what I had done. He said, "You saved my son's life. I'd like to know, have you gotten any recognition for this?" I said, "No, sir. We've kind of kept it quiet. We weren't too proud of getting in a fix where that could happen.@" So later, without our knowledge, he went to the post commander, General Campbell King, and told him this tale.²⁶ About two years later when I was a student at Fort Humphreys, an order was issued for a parade and who should be listed to be awarded a Soldier's Medal but me! (Steve Hanmer was also awarded a Soldier's Medal.) In those days I was about the only man in my class who had any ribbon to wear. There weren't many awarded between wars. I knew the sucking was distasteful but not heroic. If I'd have known that it could have killed me, I would probably have been a little more careful. Thinking back on it, they do warn you to be sure there are no broken areas in your mouth before you do something like that. A snake bite kit has a suction cup, but I'd never heard of one. Again, like I said, "Do something!" Well, doing something was the right thing there.

When I first joined Company A of the 7th Engineers as a second lieutenant, I was made the property officer, which meant taking over a post warehouse full of Engineer-type items left over from World War I, and oh what a mess. They had been trying for 12 to 15 years to straighten it out, and they hadn't completed the job yet. I found something

like ten pages of shortages; long pages. so I signed for it, listing all the shortages. Ben Fowlkes said, "Just don't let any more get messed up, and we'll finally straighten it all out some day." So when we left, Steve Hanmer came, and I made him the property officer the same way. **By that** time we had reduced it down to about four pages and we continued to work on it.

Suddenly I got a letter from the Chief's office, about the first part of June, asking me if there were **any** cogent reasons **why** I shouldn't go to Princeton for my advanced degree. I didn't know **any** cogent reasons, but I knew that my wife was from Alabama and that she'd freeze to death in Princeton. She didn't own a fur coat, and I couldn't afford to buy her one. So I wrote a letter explaining the reasons and stating that I'd rather go to California, where we could afford it, than go to Princeton. That's the last I heard of it for nearly two months, and then about the 20th of July I received a telegram saying, "Report to the New York port in four days **for** passage by transport to California to attend the University of California."

I couldn't possibly turn over that company that fast and pack and drive to New York, so I called and asked permission to go overland by car. This of course was risky financially since you might not be reimbursed for anything except what could be related to the specified route, but they told me to go ahead. So we drove, and we drove into Berkeley about the eighth or ninth of August. En route, we had seen the Grand Canyon and been to the Olympics in Los Angeles for a day. We planned to visit my grandparents in Vancouver, Washington, since it was early August, while waiting for the fall semester to start at U.C., presumably in September, but thought we could rent an apartment then while there was no crowd. So we started at the engineering school and went out the gate and stopped at the first decent-looking apartments we saw. And the lady said, "Oh, you're going to be a student here this year?" And I said, "Yes ." She said, "Have you registered yet?" I said, "No, we're coming back in September to register." She said, "School starts tomorrow:" That's the first I'd ever heard of any school starting that early. That stopped

our trip to Portland and Vancouver, and we rented the apartment on the spot. I rushed to the university and met Dean [Charles] Derleth, and he said, "Oh, you're not coming here this year, there's not a word about you." "Well," I said, "I'm here, I've been sent here, what have you done in the past?" He said, "In the past these engineer officer groups have been to a summer school first, which entitles them to get a master's degree. But you can't get a master's degree, because you're only going to the two regular semesters." He said, "Furthermore, in the past the Chief of Engineers' office has always told us in great detail exactly what courses you'll take, and we haven't heard a word about you." I said, "Isn't anybody else coming?" He said, "We haven't got a word on anyone. You're it." So Dean Derleth said, "Here are some reports from prior years of what your predecessors have thought of us and the courses. Take a look at them, come back tomorrow morning early, and tell me what you think you ought to take."

So I went home and read all those reports and made up my mind not to take the courses that my predecessors had said were poor or not of value to us as officers, but also not to pick just the easy ones either. The next morning he said, "Fine. That's it." And I started. About a day later another officer showed up: Bill Carter, I think, was the second one.²⁷ He's a retired major general now, class of '30. Anyway, he showed.

And then six more dribbled in, day by day. Finally, after about two weeks, I was taking my first test in hydraulics under Dean [Morrough P.] O'Brien--he was later a dean, he was just an instructor in those days. He had started the course off by starting at one corner of the room and walked around the four walls deriving a calculus equation. He lost me back at the second corner. So I was having a hard time staying with this class. But as I am taking this first test I look up, and there's a familiar face at the glass door, and it's another classmate of mine, Al Viney, who 26 years later would be the deputy for troop operations while I was deputy for construction in the Chief's office. He looked, and I waved him in to an extra seat by me. I said, "Sit down. You

remember we took hydraulics at the military academy. This is just a little test in hydraulics. Take a question paper and respond to it, and when we get through with it I'll take you around the college and **get you** started, because I've **done it** now for about seven other people. So I'm the tour guide." So he sat down there.

Q: There were eight other people from the Corps?

A: Yes. They had just dribbled in. We had eight of us there by that time. And Al Viney was the ninth and last one. Anyhow, he read the first page and didn't write a thing. He looked over and I'm writing busily, and he looked all around and everybody's writing. He turned the page, and about this time sweat began to break out on him. And he didn't write a single thing. After about five minutes of letting him sweat, I said, "Relax, I don't know any more about this than you **do**, but we're just going to have to get out and learn it. Don't turn anything in, I just thought you might get a shock this way." He said, "I got plenty of shock!"

So we more or less loosely organized our studying. Most of us assembled every night in **one of** the apartments where the men took over the breakfast or dining **room and** our wives took over the living room or an adjoining apartment. We worked like dogs, and we worked every waking hour. We would take a break Saturday night about 11 o'clock and take our wives to Oakland to the late, late movie for about two hours. Then we'd come home and go to bed and start working again the minute **we woke up Sunday.** **And** with that effort, at the end of the first semester, we were still way down, way down. Then we got smart and took a couple **of easier** courses for the second semester and concentrated on the things we thought were most important in the civil engineering field, and we all came right on up near the top of the class.

But we had to write a thesis. The dean and several of the professors told me that we were doing a heck of a lot more work than our predecessors. But we didn't get a master's degree, we got a B.S. in civil engineering. So I'm a B.S.-squared! That's never bothered me. I don't think it would make a

difference except in the academic world. The main point is to stretch your head, and they sure stretched it!

But, **you** asked what choice? We took basically civil engineering, because we didn't know **any** better. We had no instructions, or guidance, other than what had happened in the past. And the facts of life were that **1932** was the year of the pay **freeze**, and there was a holiday of pay in July-we didn't get paid. And there wasn't much travel **money**. And they couldn't send us to the summer school course because they didn't have any **money**. **As a result the Chief's office got clear out of gear as far as cranking it up.**

Q: And that's why the list of names had never gotten **to the university?**

A: Yes. And again, **most people would have thought if you got it all sorted out by the end of August you'd be in good time, but school started on the eighth of August, as I remember it.** It was a shocker. But anyhow, we took, to start with, what I had come to the conclusion we ought to take, after reading the remarks of the prior years, and Dean Derleth had approved, and all the others arriving after me just glommed onto that same course.

In the spring we diverged a little bit, but basically we were all taking civil engineering. I called on the Division office in San Francisco and with their advice selected a thesis studying the movement of sand on the bottom of San Francisco Bay. My 1929 classmate, Bruce Rindlaub, thought this was a fine choice.²⁸ I thought it was a good one too. **And I thought we had it made because we could ask the Division or District to get us some real true samples from down there to work on,** and this would be better than anything anybody had ever done. Mike O'Brien, with a straight face, said, "That's a fine idea." Frank Cothran and I **were going to do it.**²⁹ Then Bruce Rindlaub came--he'd been captain of A Company our first class summer--and he said he'd **found out about it,** and could he please join the team? Well, he was a hard worker, so I said, "Sure, if he wants to do it, let him in."

We had a flume that ran about 35 or 40 feet, and we had this fine beautiful sand from the bottom of the bay in it, but it took about three hours of running the water **to get** the little ripples on the sand synchronized and built up **to** where they were really doing something.

We had classes every morning so we could only run the flume in the afternoon. So by the time we had to quit, because we'd run out of time, we were **just at a** point where it was time to really start taking readings. We never got anything consistent. And this went on and on, and we got up to -- well, you graduated in early May, the 15th of May, I think -- we got up to about the middle of April, thereabouts, and we were over there four or five days a week working with no consistent results.

Rindlaub finally came up with the idea that if Frank Cothran and I would run this model in the afternoons while he studied, he would take the data and analyze it at night. It was a good effort, but it was futile. We just never had -- the points on the graph just never had any consistency -- it looked like a shotgun blast. I didn't know what we were going to do, and I said to O'Brien, "We're not getting anywhere." He said, "I knew you weren't going to." I asked why he didn't tell me, and he said, "I thought you'd learn something." I said, "I've learned a lot." (I got even with him. Years later I was president of the Beach Erosion Board when he was a member. I had a lot of fun twisting his tail about this thesis.) He told us that if we would write up anything decent, he would give us a passing grade because we had really worked pretty hard and tried. I said, "All right." I went home and got Frank Cothran. I said, "Look, we aren't going to graduate unless we jimmy this some way or other in order to have something to turn in." He agreed, so I said, "Okay, let's draw a curve and let's write the equation of that curve. Then let's work backwards and plot the points so we end up with a curve." So we did, and we began feeding this stuff to Rindlaub. Gradually it began to fall into line.

One day he came busting into the lab and said, "We've got it, we've got it:" And he came up with our same equation. so we rushed the thesis

together and put it in shape and took it up. I said to O'Brien, "Everything up to the date of so and so is a fact, but everything beyond that is fiction." He said, "All right, I understand, you'll get a passing grade." Bruce Rindlaub was so intrigued with this thesis that he decided to ask the Chief's office to let him stay another year and continue the study. And they approved it.

The day before graduation, Bruce decided he'd run it himself just to see how pretty it 'would come out. And he ran the flume and nothing fell on the curve, which was to be expected. And he came around the next morning and accused me of being a crook. I told him, "You're right, I am. M.P. O'Brien knows it, however. We've done this together. We had to do something in order to graduate." Well, he was mad still. He didn't speak to me again until once [when] I ran across him in the Philippines in World War II. We got shortchanged. We did a lot of work. It didn't do us a bit of harm, and I doubt seriously whether it makes any difference. But we are B.S.-squared and not anything else.

Q: Next you spent some time with the Civilian Conservation Corps.³⁰ What do you recall about that assignment? Were you loaned to the CCC?

A: I came back from California by car with temporary duty orders to Vicksburg, to the laboratory [the Waterways Experiment Station], to get some experience.³¹ And we drove through Vicksburg, and I almost went by the lab and reported in and I thought, no, we've got two weeks' leave coming. I'll wait till the leave's over before I report in. So we went to Birmingham, and then we went down to Clearwater, Florida, to the beach, and had a nice visit. And about four or five days later I got a telegram from my father saying, "Wherever you are, report to -- call in to -- the Corps area command up in Atlanta immediately." So he wasn't sure where I was and probably thought I was AWOL or something. But anyhow I called up Corps area and they said, 'Report to Fort McClellan tomorrow.'

So here I am **down in** Florida with my family and I have to report to Fort McClellan tomorrow, which left them stranded. Fortunately, my brother-in-law

was there. So I drove up to McClellan and checked in, and I was assigned to CCC duty with a company to be located in a camp in Blue Mountain, Mississippi. And they were leaving by rail three days later, so I had to get the car back to where my family was staying in Birmingham.

I got on the train at Fort McClellan with a bunch of boys and the captain who was commander and a couple of other officers -- this man Whatley was one of them -- and we went to Blue Mountain, Mississippi, where we established a camp on the **grounds of a** girls' college in June of '33. It was an odd situation. Fortunately, the dormitories weren't occupied in the summer for they didn't have summer school in those days. It was a little dinky place, but we set up the camp, and it was pretty good experience. These were all southern boys, largely farm boys. They needed **the money**. They **felt pretty big for their britches, and there** wasn't too much discipline, but we had to instill it. And what we really were was the administrative team -- see to it they were housed and fed, disciplined and cared for medically, and so on. The Forest Service or Soil Conservation, or some state agency, furnished supervision of the work.

Q: But you were Engineers who were doing the other work?

A: At that moment I wasn't an Engineer, I **was an** available officer. And there were about six or eight of these camps within a radius of about 35 miles. Several of us had our wives come up to the **little town of Ripley about** 15 miles away. They had a hotel there where the wives could stay, and their room and board was \$30 a month. About two or three times a week we'd get to go in and spend the night with our wife, whoever could get away.

I learned more about leading people and getting **people to** do things without beating them over the head. The first problem was a boy one night who'd gotten too much to drink, and he was really drunk, oh boy. It took about ten people to grab him and hold him. The company commander had something to take care of it and went to get some ipecac. Now I had never **seen ipecac used**, and he said, "**Hold his mouth open.**" And somebody held his mouth open and

Captain Camp dropped half a bottle of ipecac in his throat. Then he said, "Now you can turn him loose." And sure enough, this had a remarkable effect. We never had any more drunks the whole time I was there. He lived, of course, he was just feeling kind of bad.

About the middle of August I got orders to go on to the Engineer School, which is where I had been going anyway. Yes, I had a sieve of CCC, and that's why I thought in terms of getting reserve officers who had been on that kind of duty when I was activating the 79th Engineers, because you did learn the living, housing, and eating business; and discipline, which lets you get started so you can do some training.

Q: Where did you go from there?

A: Next we went to the Engineer School for the regular company officer's course, which was an interesting year, not terribly head-stretching. Then I went to West Point as an instructor in military engineering and military history.

At West Point, Westmoreland was one of my students, Throckmorton, Fred Clarke, Abrams.³² Fred Clarke was the class of '37; Throckmorton, '35; Abrams and Westmoreland, '36. Goodpaster was a cadet.³³ His father-in-law was an executive officer at the military academy later on. I knew his wife, his father-in-law, and mother-in-law as well as him.

Abrams was one of the best soldier's soldiers, I believe. Later on I visited him around the world from time to time on inspection or one thing or another, and he impressed me every time. He was down to earth and knew what he was doing, knew how to get it done. Of course, looking at it from the viewpoint of Vietnam, none of them look too good because that wasn't the right kind of war to be in. When you go back to it, there hasn't been a war since World War II that we've tried to win. We've tried just to not lose them, and that makes a helluva difference. You know, in a football game like last week's Rose Bowl [January 1978] one team was beating the daylights out of the other. But then they decided to be conservative and just hang on, and zingo, two touchdowns and the other team

almost caught up to them. Well, it's somewhat the same way in the military. You can see it too often.

While I was an instructor at West Point -- I'm not sure if it was the summer of '35 or the summer of '36 -- but another officer and I in the engineering department at the military academy were sent up to Cornell to get ready to increase the amount of instruction on concrete that was given to the cadets, the first classmen. It wasn't very much, even when we increased it. The department had decided they were going to use the textbook of Urquhart and O'Rourke from Cornell,³⁴ and so we were sent up there to take some courses during summer school and get to be the experts to teach the other instructors.

When we got up to Cornell, we found to our surprise that Urquhart and O'Rourke were putting out a new edition and were pretty well wrapped up in that and weren't doing much teaching that summer. I conceived the idea that we would volunteer to proofread the book for them, if they would in turn answer completely and fully anything we were questioning or brought up. This turned out to be a fine deal for us, I don't **know** about O'Rourke and Urquhart.

The way it worked out, we sat down in our room where we were boarding or staying, I forgot what, and proofread that book for every nit-pick because we knew the cadets would nit-pick and ask questions. About twice a week we'd make a date with Urquhart and go over to see him with our voluminous notes, and he'd **try** and answer the questions. Well, he would sometimes answer the questions that were probably satisfactory to me, but I knew I couldn't take that and explain it to the cadets, so we'd dig into him some more. And finally, quite often, he'd **say**, "That's in O'Rourke's part of the book, let me get him." So he'd disappear out the door and come back with O'Rourke and O'Rourke would do the same thing. Finally, I would just say, "I don't believe I can explain that." O'Rourke said several times, "I'm sorry, I don't blame you. In all honesty, I just took that from so and so's textbook. I can't give you any better answer than that. I just bodily lifted it." That gave me a little more insight

into the textbook world! It worked out real well, and we worked hard at it. We did them a lot **of good**. I I'm sure, in proofreading. They corrected things where their language was not too clear. We went back and then had to teach the other instructors what we thought we had learned about it and at least show them the tricks of the trade in the book.

While at Cornell, to get a little bit of variety, I took introduction to engineering geology. It was extremely interesting because Cornell's is in the Finger Lake country, and I got interested in pulling fossils out of the side[s] of cliffs. The course was strictly a child's guide to geology, but it opened up the subject. I later used information and enjoyed it tremendously in going around Alaska.

The next summer when the cadets had gone, Colonel Mitchell called me and said, "Look, I think there's a chance for us to get some of the equipment from Passamaquoddy, which was then just closing down, and they had a concrete lab.³⁵ He told me that if I could talk them out of any that was declared surplus and bring it down, he'd try to set up a better laboratory arrangement. This, of course, was glorious, and I took off with my wife and we drove up there. I saw Passamaquoddy grinding to a halt and winding down and saw the lab stuff and was particularly impressed with the man who ran it, a man named [Charles E.] Wuerple.³⁶ And I came back and recommended highly that we get the whole **thing** and that we bring Wuerple, too, and that in order to finance this we recommend to work a deal for a laboratory established at the military academy jointly for the use of training cadets and for the North Atlantic Division. I don't remember the details, but it worked. We got a new building. We got Wuerple, and we got his lab. He ran a concrete lab for the North Atlantic Division and any other Corps activity, and we got the use of the facility for training cadets. We got the backing of him and his staff to help us when it came to putting this instruction over. That went on for some little time. Finally they moved Wuerple away, I think up to Mount Vernon, New York. They just left it as a cadet laboratory without any real research. Eventually, Wuerple became the paid executive for the concrete

association. Somewhere up in the Milwaukee area was his headquarters.

Passamaquoddy was the tidal project. It was a big project during the Depression at the same time they first started to build the cross-Florida barge canal -- those were the two big things. It's right up on the border between Maine and Quebec, Canada, and there's a tidal switch of .25 or 30 feet. They were going to control that and build a series of lakes and switch **from one to** the other. It was a good project. It cost a lot of dough. It was definitely a New Deal thing. It was to make work and of course it would have some benefits. The major trouble was there wasn't any industry up in that part of Maine that could economically use the power. The cost of transmitting the **power** from there to the Boston area was really one of the obstacles to making it a real successful project. But they had a brand new lab. They were making freezing and thawing tests on the concrete and things like that, **so it** would be important in that area. Wuerple was an outstanding expert in the thing, so it was effective.

Q: How would you compare West Point when you returned as an instructor [1934-1938] with West Point when you were a cadet?

A: Well, let me set a little background for you. **My** father had been offered an opportunity to get back to West Point early in my cadet life, and he very kindly turned it down. About a month before I graduated, about the first of May, he accepted another offer and as executive officer was the number two guy to the superintendent, not on the cadet side but on the post side. The executive officer supervised everything for the superintendent but the cadet activities. He stayed there as executive officer clear up to the **early** part of '35, through a couple of superintendents.

When I went back up there in '34, I was teaching my brother in the class of '35. We had a weekly Sunday dinner at my folks' house, and we made a deal that nothing said on that occasion could be used by anybody else in any way that would trap anybody. **So my** father could talk about things from **the** administration viewpoint, I could talk from the

instructor level, and my brother could talk from the cadet level. We had quite a combination there, but we carefully avoided using anything that we'd heard. We had a pretty good concept of what was going on. As far as I'm concerned, there wasn't a heck of a lot of change between the time I was a cadet and those times. As far as the honor system and what it was trying to accomplish and all that business, I was satisfied with it. I had a good feeling about it at that time, and I don't think there was any difference -- the honor code was working the same way pretty much. The size was about the same. There was not too much difference.

Q: And from West Point you went to the Command and General Staff School?

A: Command and General Staff School³⁷ **was really a** shock because it was a tough place to get into. People were competing for the assignment all the time. I wasn't competing. I was just a lieutenant, and there was one other lieutenant. The personnel officer from the Chief's office came up to West Point one day and took me aside and said, 'I think we're going to send **you** to Leavenworth as a student.' I nearly dropped dead! But it was real fine and a wonderful thing. It really made **me**.

Q: Did they give you a reason for picking you out?

A: I don't know why they did.

Q: It wasn't usual for an officer of your rank, was it?

A: Oh no. In the prior years there had been a two-year course, and there had been a couple of suicides at Leavenworth, not doing too well at it. It was real talent they were collecting there. The other lieutenant was an Air Force man, nonacademy, named [Paul] Hansell, who was considered the finest theoretical tactician in the Air Force, at least the other people always told us this, people like Tommy White, a future Air Force chief of staff. I was extremely young. As a matter of fact, during the year enough people were promoted to major and lieutenant colonel who passed on captain's bars, and major's leaves, and even lieutenant colonel's leaves, that I never bought any of that insignia.

You'd come in in the morning, and there on the corner of your desk would be a stack of new rank. I don't know how it happened. I don't know why. I don't know whether the soldier's medal had anything to do with it. I don't know whether I had gotten a good report out of West Point or what, but it was fine as far as I'm concerned, it made a big difference.

In the "W" row at Leavenworth, when I was there as a student, I can't remember a single one of the 15 to 18 officers in that row who didn't become at least a brigadier general in World War II. There were lieutenant generals, major generals. Tommy White, Chief of Staff of the Air Force at a later date, came out of that class.³⁸ He was from the "W" row. It just happened to be the right time frame, and then the war came along at the same time.

Incidentally, you look at my career and you'll find, **except** for my first year at Mobile, I went half of my career on the military side and in schools and the other half more or less on the construction side. The end of World War II was the dividing line. I was 16 years coming back to a District and then another 20 years on the other side.

Getting to Leavenworth, in those days at that age couldn't help but advance my chances. I worked pretty darn hard, and another thing was, as a lieutenant, I didn't think I knew everything. The worst problem you have with an Army school is the more expert you are in a subject, the less you think of it. Because you think you know better than the instructor, and the instructor is trying to put across a point, not fight the issue. I found that out when I was an instructor at Leavenworth. I got together with Hansell, he lived downstairs, and studied with him every time we thought there was going to be an Air Force problem, and he studied with me every time we thought it was going to be an Engineer problem. We both did poorer in those two subjects than we did in all the other subjects. You think you know it and so you don't have an open mind, listening to what they are trying to tell you.

Another thing they taught me there at Leavenworth, they gave us a little black loose-leaf pocket notebook. They told us that you could have it open any time. There was no test, exercise, or map problem that you couldn't open that thing. so you could write anything in there you wanted to. But they had one hell of a lot of subjects! I'd sit down with a man named Jimmy Green, class of '27, Signal Corps.³⁹ He was a real brain. He later became professor of electricity at the military academy after the war. He and I studied together every night. We'd write things down on a big pad and then we'd sit and condense them, and we'd brief them to where one letter meant a whole word. By the time you had done that three or four times and put them in the little black book, you didn't need the book. It did give you a crutch, a feeling of satisfaction, but the exercise of doing it was what made you learn it. I've found that true in my speeches and things like that since. I like to outline a speech, then write it, and then reoutline it, then put it on cards -- I don't look at the cards very often, by that time I don't need them.

Q: Should we move on to your service in southeast Asia during World War II?

A: Well, we haven't gotten to Hawaii again yet.

Q: With the 3d Engineers?

A: Yes. It was a three-year tour in those days, but I got sent back to Leavenworth after half a tour, which made me disgusted. I would rather have stayed in Schofield Barracks than have gone back to Leavenworth.

Well, again, about three months before graduation from Leavenworth, I got a letter from the Chief's office asking if there were any cogent reasons why I should not be sent to the Philippines. I went back to them very happy and said I thought it was a fine idea. I'd never been there. My father and mother were there. My father was commanding general at Corregidor, and it would be nice to be stationed near them once. I thought I could learn something and be of more value to the Army. It was just fine.

In late May I got a telegram asking were there any cogent reasons why my orders shouldn't be changed to Hawaii. I sent them about three pages of telegram with all the reasons: I had been there as a boy and gone to high school there: I'd been to the university; I'd seen it; I knew the islands, the people, and there wasn't much more I could learn on that; and I needed to get more broadening by going to the Philippines. They came back with, "Your telegram noted. Your orders to Hawaii are being issued."

But there's another thing I've learned. Almost every time that I tried to fight real hard against doing something proper authorities had decided I should do and got overruled, it turned out to be in my best interest. So I've always tried to tell the young officers, "Sure, try and manage your career to a degree, come up with what you'd like to do, but don't fight the problem. If they've got a good reason for doing something, go ahead and do it because it will probably turn out better for you than if you don't." At the time they had a reason, I'm sure, balance of the number of lieutenants or captains or something. I was going to be a captain by that time by act of Congress. Had I gone to the Philippines and stayed the three-year tour, I would have been in there when the war started, and I would have had a lot different career. You didn't get out of the Philippines by the time the war started. Most everybody over there got captured or killed or wounded and that completed their activity for four years or so. Some of them overcame it, but it sure would have made a difference.

So I went to Schofield Barracks. One thing it did do, it got me away from where there was any modern equipment. We were still -- my first unit at Benning had been a mule-drawn outfit. We had a mule-drawn pontoon train. We had mule-drawn escort wagons. I was a mounted officer, and I had three horses in my company. The modern World War II equipment just didn't get to Schofield by 1941. In fact it wasn't getting much of any place. We didn't have much. As things began to stir and build up they got them other places, but at Schofield we were still running around with little dozers and trucks. It was good training, and you had good weather, and you could get at it, and it

was good experience. I had a chance to be a company commander of a bigger outfit and in a division.

Most of the younger officers complained that the training wasn't the proper kind, they weren't getting enough time, or there was too much emphasis being given to this or that, or the troops were dissipated by special duty or athletics. We in the 3d Engineers kept griping along with all the rest of them. One night Lieutenant Paul Yount, 40 who had been an instructor with me at West Point and was now the adjutant of the 3d Engineers (he later became chief of transportation, as a major general), and I were sitting there griping, and our wives said to us, "If you're going to do all this griping, why don't you do something really positive, why don't you write a letter to the chief of staff of the Army and tell him how he ought to be running this thing? You sit here and tell each other."

Well, they kind of stirred us up a little bit. So we did. We sat down for two or three weeks at night and wrote a letter to the chief of staff of the U.S. Army, through channels, making recommendations for improvements in training, as, for instance, when a unit goes on tactical training they should get special duty people back in order for them to go as a unit. It would produce better training if the tactical units were separated from the administrative side, because tactical units ought to be able to get up and go without leaving key people behind to run the bakery and the administration of the post. There ought to be bigger training areas that they could move to. They ought to move there for months at a time, not days at a time. And we went through a lot of recommendations. It wasn't bad, it really was a good idea.

We put it all together and addressed it through the commanding general of the 24th Division, which was Hawaiian Division. We put it in the mailbox and right after we put it in the mailbox, we lost our nerve. We thought, oh boy, I hope somebody loses that. Days went by and nothing happened. Then about two weeks later I was in my orderly room and somebody came in and said, "You're wanted up at

division headquarters right now." I went running up to the division headquarters and who should be sitting there looking a little white but Lieutenant Yount. And I thought oh, here we go. So we went in and reported. The commanding general asked us, "Did you write this suggestion to the chief of staff of the Army?" We said, "Yes, sir." He said, "You had the unmitigated gall to do that?" "Yes, sir." "Well, are you sorry you did it?" We both said, "Yes, sir." He said, "Well, I'm not. It's pretty good: What you've said here is well worth thinking about. You did at least have sense enough to put it through channels, so we can't get you for that. I think it's fine, and I want to put an endorsement on, saying that these items merit consideration." Oh, what a relief:

This was about 1940, and near the end of the war I received through channels **about the 25th endorsement back to me, my copy of it stating that** "The chief of staff of the Army appreciates your interest and your thought but believes the letter is redundant. The ideas expressed therein have to a large extent already been adopted by the Army. We appreciate it," and so on. It's true, they had. Much of the development in the early days of '41 and '42 was along the general lines of what we had suggested in the letter, but it had never gotten to where it would do any good. But it happened, and we were dumb enough to try it. We didn't get skinned.

Hawaii? I don't know. I got a lot of experience being football referee in the Schofield Barracks football league. We did a lot of planning on demolitions in the hills and the tunnels. **you know they bring the water for the pineapple and sugar fields through the mountains because the heavy rain falls on the other side.** So they have tunnels to bring it right through. Well, we were afraid the invader would land over there and come through those tunnels. Every so often we were sent to explore them and make up our mind what size charges should be used to destroy them. **The thing that always intrigued me was that when you got there to the gate, the man who unlocked the gate to let you go in, and who would come along, couldn't speak English, but he'd point out the chamber where the explosives were to go.** He knew all about it. He was a native-born Japanese, inevitably.

I often wondered what would have happened if there had been an invasion. We had an alert in June of '40, when the Japanese fleet disappeared from sight someplace. We were on that alert to a large extent from there until I left the first of February of '41. That's too long to be on an alert. It loses its effectiveness. But at that time the naval commander restricted the number of ships that could be in Pearl Harbor. The dawn patrol went out every morning from the Air Force. We had people guarding bridges all around the island. But as I say, it went on too long.

The thing that always bothered me about Pearl Harbor, I'm sure there was economical and political reasoning behind it, but when I sailed out of there on a transport on the first of February, there couldn't have been a Pearl Harbor because there weren't that many ships allowed in there, maybe one or two at a time. There couldn't have been the problem of not being able to get the ammunition out because we were on the kind of alert which had ammunition by the guns. There were several forms of alert -- in one case you'd have all your guns out and manned and the ammunition there, and in the other you'd have just the opposite, with all the ammunition protected and put away someplace. So it was almost impossible for me to comprehend ten months later, when I sat in my living room at Leavenworth and listened on the radio to the story of the attack. The complete change from February 1941 -- the radar not working too well, the ships all being in Pearl Harbor, the sailors being on leave. I just couldn't believe it.

Now, our little boy, who was then three years old, was in the living room playing around when the radio began sputtering out this stuff, and we had to turn off the radio, because he kept crying and saying, "They're sinking my ships, I saw those ships, I know those ships." I had to go next door to listen. To me it was just as hard to absorb that this could go on as it was to him. I'm convinced, without really knowing facts, that the powers that be had complained that with the ships being at sea, and the sailors being kept away, they weren't selling enough goods, and that we had to reverse this posture. Why they were on an anti-sabotage alert, I don't know, but there sure

was a lack of communication and information-passing at that time. It couldn't have happened under the circumstances of ten months earlier. It could have happened, but not that badly.

During the latter half of 1940, the 3d Engineers had the opportunity to do a little troop construction, and I found out more about what the troop units can build or not build, can do rapidly or only slowly. Frankly, I was probably better off mentally going back to Leavenworth as an instructor than staying in Hawaii. Certainly, as far as my long-term future was concerned, I was better off going back to Leavenworth than than to be sitting out on Bataan or Oahu.

Q: And you got orders to go back with no reason? You said that was after a year-and-a-half, which was unusual.

A: I know what the reason was. The acceleration of building up new units in the States was going on, and they were trying to get the instructors away from Leavenworth that had been there, so they were bringing in fresh blood, and I was probably replacing a lieutenant colonel who went to colonel immediately; I was a captain. And he probably went off -- well, I know he did -- he went off and modernized the armored engineer training. That was it, but they didn't ever tell you.

When I went back to Leavenworth as an instructor, classes were up to 800 for only two months at a time, so there was a terrific turnover, plus the commanders and general staff of the new divisions came there for a month of schooling. I really got to know by sight, sound, or reputation just about everybody in the Army. It was an unusual opportunity with the four years at West Point and then a break and then another four years at West Point, followed by a year in the Leavenworth class and then this Leavenworth instructor business. I sometimes have a little trouble separating the experiences.

Most of the instructors who had been there when I was a student were still there, but within six months most of them were gone. For instance, within six months, I became the responsible

instructor for two key areas: landing on a hostile shore and airborne operations. As an example, I became a director of the Army Cooperative Insuring Association [an insurance company] and in less than six months I was the senior in time on the board and became the president. And that meant I received \$25 a month as president, and so I had to get a Social Security card. So -my Social Security card dates way back to '41 or '42, which is far earlier than most regular Army military.

Also, I got the chance to go around the country observing and learning from the exercises and training going on to come back to Leavenworth to improve our presentation. We were by this time running out of time and trying to teach too many people, so we were doing it by demonstrations to a large extent. We put on an act, a four-hour act, with pretty much no ad-libbing but you didn't stand up there and read your lines, you just went ahead and talked, and went over certain ideas. This was true particularly in both the landing on the hostile shore and the airborne operations -- both of which were in the wave of the future, and for a captain or major of Engineers to be the instructor heading those teams was quite something.

But again, I'd hit there at just the right time to be senior in instructor time and to move up the ladder as more experienced instructors departed. As I have said, I met lots of future leaders and remet many I had known before.

Jimmy Gavin, one of my West Point classmates, was a student at Leavenworth when I was an instructor and came around to see me, spent a whole Sunday afternoon talking with me, wanted my advice. He wanted to get into airborne, but he didn't know whether he should do it or not. I told him that was the last thing I wanted to do. I wanted to be a generalist rather than a specialist. But I said, "If you are ever going to do it, do it this minute. Don't wait till tomorrow. This is the time. It may not amount to a row of beans, but if it is going to, jump now." This was about late '41, and he did. He got out of that school when he graduated and immediately applied for the other business and got into it. And he did right well at it. He was asking me about going airborne because I was running the exercise on it.

And you'll find out later that because I was running the exercise on landing on a hostile shore, it affected the next moves that came along. So why do these things happen? Darned if I know. But they're interesting.

Q: Do you mean a next move in terms of immediate or longer range?

A: No, my next stage, when I went from Leavenworth, what happened to me, how I got away from there. For instance, I was on a transport that was participating in an exercise in amphibious training off Chesapeake Bay, in fact it was in hostile submarine waters, so I got a little ribbon to put on, American theater. I went for a month to the largest maneuver ever conducted on U.S. shores -- the September 1941 maneuvers in Louisiana. There were many things wrong with them, but they were a real training ground. Eisenhower was a lieutenant colonel during that maneuver.⁴¹ I was a captain, and I got selected -- why, I don't know, tickled me to death -- I got issued a driver, and a command car, and a case of rations, and went for a month to the maneuver. And so I went on both sides: I saw everything, wore a little green armband so I could go anywhere.

I got particularly interested in General George Patton.⁴² I knew George Patton wouldn't pay much attention to the rules, and one day I noticed that his outfit, the 2d Armored, which was in eastern Texas, had disappeared from the other side's intelligence map. They didn't know where he was. I began thinking, he won't pay any attention to the rules. The rules say you won't use commercial gas stations, you won't use commercial eateries. But when he wants to accomplish something, he'd just ignore that. So what is he going to try and do? And I looked at the map awhile, and I said, "He's going to try and come in and capture Shreveport from the rear -- some portion of his division, he can't get his division there, but he'll come in and make a show, and the newspapers will publish it, and Patton will be the hero." So I went to find out if that was happening.

I drove up to Shreveport in the command vehicle -- it was a panel truck really -- and when I got there

asked around quietly if anybody had heard anything of armor nearby, but they hadn't. so i looked at the roadmap, and picked out the road from east Texas, and told my driver, "Let's go down this road about 30 miles." We went down the road, and hadn't gone very far, when suddenly we came to a convoy. Standing up in the first armored car was Patton holding his hand up and saying, "Halt!" so i told the **driver** to stop and we stopped. He called me over and said, "What are you doing here?" "Well," I said, "I'm observing the exercises." He asked my name and I told him and he said, "How come you're here?" "Well," I said, "I'd rather not answer that, sir." He said, "That's just the reason you will answer it." I said, "All right, sir. I figured that General Patton would be coming in here." He said, "Well, do you know who I am?" I said, "Yes sir, you're General Patton." He said, "Yes, that's right. How did you happen to figure I'd be here?" I said, "I figured that you'd want to make a big show and look like you had won the war and you wouldn't let the rules bother you too much, so you'd be here with something fast-moving that could get in there and make a big showing."

He said, 'Yes, you figured that all out?' I said, "Yes, sir." "Well," he said, "I'll tell you what. We're going to bivouac down here in about two miles. You come on and spend the night with us. I'll let you sleep under our command vehicle with me." That was really a great privilege to sleep under his command car with him, but he just wanted to keep me where I couldn't get away and go tell anybody. So I joined his convoy, and the next day we entered Shreveport and the papers spread it all over. **It really** gave me good insight into George Patton. I'd had some knowledge of him before, but now I knew a lot more about **him**. This showed up later and was helpful. I learned a lot in that month-long maneuver. It was a real lesson to most of the staff to realize they couldn't go night after night, day after day, 24 hours, they had to take some breaks, bring in the number two guys and so on. Basically, **it** was just an exercise in living, there wasn't any real shooting. There wasn't a whole lot of marvelous strategy or tactics, but it was three weeks to a month of just plain living it out, and it was damn good experience because we **hadn't** had anything like that in a long time.⁴³

Then again, I got sent off to visit the Navy at the Providence, Rhode Island, Naval War College, and see some of the amphibious Engineer troops training in New England and see what was happening.⁴⁴ And this was in July of '42. The commandant of the school called me in when I was to be sent on this trip and said, "Now I want to tell you something. You're not going to get away from here. You're going to stay here.. You're going to be an instructor here for a long time yet. And if you try and get somebody to ask for you and I find out about it, I'll cut your throat. Now do you want to go under those terms?" I said, "Yes, sir, I think it's a good idea." He said, "I think it's a good idea, too, but I don't want you going and trying to sell yourself/ I said, "All right, sir, I won't." So I went off on about a two weeks' trip, observed maneuver& went to observe the amphibious Engineers up in New England, went to the Naval War College, came back about the first week in August. And I reported to him and told him what I'd seen and learned and said I had not made any effort to get transferred. He said, "All right, I accept that."

About a week later I got an urgent call to report to the commandant's office. I walked in and he said, "I want you to know I don't think you did this, but you are leaving today with both winter and summer uniforms and you'll report to Washington tomorrow morning, and I don't hold it against you because I don't think you had anything to do with it." So I got all excited and took off thinking, oh boy, I've got to win the war.

I got to Washington, and I found out what had happened. There was an organization called the Amphibious Corps, Atlantic Fleet. It was a [Navy] organization and it had controlled [the 1st Infantry Division and] the 9th Infantry Division and some Marine troops [the 1st Marine Division] to train them in developing, improving, and becoming experts in amphibious operations. The Army had become disappointed with the state of [amphibious] training.... So the Army had come up with the idea of having the 3d Infantry Division on the West Coast, a unit that had trained in amphibious operations, split their staff with the commander, Jonathan Anderson,⁴⁵ and some top staff and some

number two staff members coming east to become the Amphibious Corps, Atlantic Fleet, while retaining their positions in the 3d Infantry Division.

They had been hurriedly assembled in some of the temporary buildings at the War College, and they realized about the middle of August they didn't have any Engineers. And they said, "Where will we find an Engineer that knows anything about amphibious operations?" They didn't particularly want to take the commander away from the 3d Engineer Battalion, so one of the younger ones of the G-3 staff that had come right out of the Leavenworth class and had been ordered to Washington for this Corps staff, a man named Connor, Bert Connor,⁴⁶ whom I had taught as a cadet (he's now retired as a lieutenant general), said, "I know the one you can get. You've got a good Engineer out at Leavenworth who's teaching the stuff, and he knows what it's about. Why not get him?" So bingo, that's why I'm there. And that's where I say the connection came.

I got there and they couldn't tell me much. We knew an amphibious operation [TORCH] was being cranked up, but we didn't know what they were trying to accomplish. We were just fishing around, but we gradually learned a little more. In about a week they sent us down to Camp Pickett, Virginia, which was to be the location of the Corps headquarters, and we began to get a little information on the areas that they were going to attack. We knew nothing about anything on the Mediterranean side, all we knew about was the force [the Western Task Force] commanded by General Patton was going in on the West African side, and we didn't know too much about it, but we just knew that. And we knew that the troops couldn't know anything. They were not allowed to know where they were going or anything like that. So we had to try and plan everything we could, and we had to try and train them.

They began to move the 3d Division to the East Coast, and the 9th Division was at Bragg. I kept pushing for some exercises to practice going ashore, even in Chesapeake Bay. We were very much restricted because there wasn't any landing craft to amount to anything, and they finally said,

"Well, if you ground one of them and hurt it, that's it. There are no more to replace it." I said, "You've got to get these people out on exercise.", so they -- I don't know who but somebody -- designated me to run a school in the Nansemont Hotel in Virginia Beach, it's down in the Norfolk area, partway out to Virginia Beach. The Navy had taken it over, and I was to go there for a week. I was to run a school for the G-staff: G-1, G-2, G-3, and G-4; and a few more of the 2d Armored Division who would be a part of this task force. They were expertly trained on the desert, but now I was to train them in a week to be experts in amphibious operations.

I went down to that hotel, and there wasn't a soul in it but me. There were Marine guards that came around every now and then. Every new Marine guard that came around and found me sitting in a room puzzling about what to do would raise hell because nobody had told him there was anybody there, and this went on. I got blackboards and lined up a course. They reported in on Monday, and I had them for six days. I had to try and teach them combat loading of ships and how you make out your landing plan and how you make out your boat loading plans, and all this kind of business. It wasn't the easiest job in the world because most of these guys knew so much more about armor than I did that it wasn't even worth talking about. But they didn't know a thing about going in the water and coming out again.

I preached and gave them some test exercises. We got a transport and combat-loaded it with tanks, and Patton showed up to watch it. The first tank lighters started ashore and one dropped his ramp too soon in too deep water and the tank went off, and that was the end of the exercise. We never unloaded another one. So they went to war without ever having practiced in calm, quiet water. That was it.

We had a little infantry exercise further [sic] up the bay. They bashed up some lighters and they told you, "All right, you will have that many fewer when you go." So that ended that, and we didn't do the things you should do. I went down to Fort Bragg and tried to see what we could do and decided

we could build them some mock-ups. Nobody had any money to build mock-ups, nobody had any authority to build mock-ups. So I said, "Okay, you build them. I'll be the authority and we'll straighten it out afterwards." And they built several landing craft mock-ups so you could practice grasping the gunnel and going over with your weapon, and they built the sides of the ship with the cargo nets to crawl down and get in the personnel craft.

I went back and wrote a request for the funds to Army Ground Forces in late August, and about the middle of September I got a letter back turning it down. They said, "No, you can't do that. There's not enough time left to use them and pay for the thing." I went back at them once more and said, "No! thank you, but they've been built. They're worn out. They have done a lot of good. The troops are better trained than they were. Now please get me off the hook." And so they came back and authorized it after we had done it. But we did get that much training in. It was scary. Somebody had to know that there was a good chance the French and the Spanish wouldn't really come in and clobber us because it looked like they were just sitting there ready to clobber us if they wanted to.

We tried to figure, what could we do to help these unit commanders? So I conceived the idea of making a model so you could take oblique pictures of it. I conceived the idea of making a plaster of paris model-of the--landing area in Fedala so that oblique pictures of it would give an impression of what it was going to look like from a little landing craft.⁴⁷ We worked pretty hard on that thing. It's heavy when you make one like that, and we carried it around to each battalion commander. Couldn't tell him where it was, but we showed it to him and gave him these pictures. You know, just two weeks after they sailed we found out the Navy had a rubber map facility up in Norfolk that made those things, beautiful job. We hadn't known it, so we made it all out with this other, and we were carrying it around. It would crack every now and then. We accomplished some good, but it was far less than we would have liked to provide.

About that time I got an offer from the corps and division commander, General Anderson, that if I

could get free, they'd like me to go along as their division engineer. Well, this is what I had been training for all my life, and it tickled me to death. So I hurriedly sent the request up, and it came back from the Chief's office saying, "Not unless you can give him a job which calls for a colonelcy, because he's going to be a colonel pretty soon. We're not going to send him with you as a lieutenant colonel."

When Patton finally got ready to go, he decided he wasn't going to take the amphibious corps, and I don't blame him. He was going to do it himself and didn't need this extra headquarters. So we got left. I got left hanging in the lurch. One thing I asked for was, "Please don't send me back to Leavenworth." So they said, "All right, we'll send you up to Fort Belvoir, where you can wait to command the next combat regiment that's activated in the Corps." And that's how I got away from Leavenworth.

Q: Was this when you assumed command of the 79th Engineer Combat Regiment?

A: I got up to Belvoir and got assigned to the Engineer Replacement Training Center, and they asked, "What do you want to do?"⁴⁸ I said, "I'd like to be an assistant exec for the center and go around and spend my whole time observing training and making suggestions to you of where it could be improved, or changed, or modified, provided you'll let me have your lesson plans so I'll have something to use when I activate a regiment." And they said, "Well, that's a fair deal." So I spent several weeks just going around looking at training and making suggestions for improvements and changes and in turn they gave me big stacks of lesson plans which I carried with me.

When I was ordered to Salina to activate the 79th Engineers, I couldn't find anybody who knew where Camp Phillips was. so we went down through Birmingham to have a couple of nights with Jeanne's folks, and then went to Memphis, and I got smart and went to the Second Army headquarters in Memphis and found the Engineer section and said, "What officers are-you going to give me besides brand new OCS?" And they looked at me and laughed and said,

"That's all you're going to get. You are going to have an average experience of three months as an officer in your outfit." I said, "You can't do that to me." They said, "Yes, we can because it's getting to the bottom of the barrel. It's now early in December 1942, and there isn't anything.@"

So I said, "Couldn't you let me go through your list of reserve officers that haven't been called to active duty and see if we can't find a few?" They thought that was a fair deal and allowed me to pick three. So I went through a big bunch of records and picked three. I particularly picked three who had been on CCC duty where they had gone through this living operation, routine discipline, feeding, housing, and health, because I figured if we could 'get some who could get us to living properly we might learn how to train properly later. So we headed for Kansas. In Second Army headquarters they knew that Camp Phillips was near Salina. That's the first time we knew exactly where we were going other than to Kansas. And we got out there and, boy, it was a rough situation.

On the tenth of December 1942, I activated the 79th Engineer Combat Regiment, Camp Phillips, Kansas, with a strength of one -- me! About two hours later a young man stuck his head in the door and asked where he could find the 79th Engineers and I said, "Come on in, you're in them." His name was Lieutenant [Winfield A.] Mitchell and he was in the cadre, and I said, "You're the first one here, so you're the adjutant. Now sit down and tell me who else is coming in the cadre.*' So he did. There were seven officers and about 110 men. He gave me some fill-in on what kind of people the other officers were, all young, pretty fine young men. With his help I picked out the supply officer, S-3, and so on. And sure enough, within the next 24 hours they began arriving. In the next week or so we received one major and three captains, reserve officers, which gave us a little experience, and we got the rest of our officers, half of whom were just out of OCS and the other half had been out about six months. So we averaged about three months' experience.

Camp Phillips was raw. There was mud. We had to put our cadre to work primarily building duck

boards so that when the troops came they'd be able to move without getting sunk in the mud. The buildings were raw, they were just completed. They leaked air. They were the cheapest form, but they were livable. The officers' quarters, the BOQs [Bachelor Officers' Quarters] had screenwire up at the eaves: the frame dropped down over them to help keep out snow. But many a night I'd wake up with my head covered with snow. And the water bucket would be frozen solid. We at least got to know ourselves but we had no equipment, nothing like that.

About three days before Christmas, before our fillers had arrived, I received a phone call from a man who said he was the corps engineer of the 11th Corps and that I was in the 11th Corps. Well, this was all interesting to know. He said, "We'd like to get you to help us out!" I said, "Yes, sir." He said, "We want you to command a second regiment simultaneously at Camp Phillips." And I said a little more dubiously, "Yes, sir." And he said, "It's the 366th Engineer Regiment, General Service. It's all black. We don't know where the cadre's coming from. We do know that the fillers are loaded aboard trains and en route to Salina now. So we want you to take them, organize them, put them to bed, feed them, until we can locate the cadre and who the commanding officer will be, and so on. But in the meantime, you'll be commanding both regiments. I said, "Yes, sir," and immediately sat down and tried to figure out what we'd do. I decided to cut my cadre in half and leave Major [Walter] Schamel, my exec, running my regiment, and I'd go over and run the other one, with half the officers and half the men in my cadre. I thought the only way I was going to get real help was to go to the 94th Division; General Malony.⁴⁹ So first thing the next morning I rushed over to see General Malony. His outfit had about six months' training by this time, and he was a very cooperative man and listened to my tale. He said, "I know what you want. You want bodies." I agreed and he said, "How many do you want? What kind?" I said, "I want bodies that can feed, house, and administer, as many as you want to give me, but that's it." He said, "You'll have them tomorrow morning." And the next morning I went over to the area of the 366th, and a lieutenant

colonel arrived marching about 150 officers and a few key enlisted men. This lieutenant colonel had been a tactical officer at the military academy when I was a cadet, and here he was far senior to me, but he was reporting to me for this purpose, and it was a help. We got the beds in place, the mess halls cranked up, and met the trains at midnight in a blizzard. They had come through a blizzard in Missouri and had no steam, no water, and no food for over a day. So the most we could do was to rush them into trucks and deliver them to their warm barracks and feed them and put them to bed. And we did and we didn't have any riot, but they were a pretty sad-looking bunch. They worked pretty well.

After about two weeks, we began receiving officers assigned to the 366th, and just at the critical moment, when I didn't know how we were going to handle us and them, too, we got word who the commander was going to be. The commander was to be Colonel Keith Barney,⁵⁰ division engineer of the 94th Division, and he was right there, and so he reported and took over what became known as "Barney's Black Beauties." And a very interesting item. Just before Barney took over, one of the officers arriving was named Finley, he was a captain, reserve, and he had been my first sergeant in the 3d Engineers at Schofield Barracks. I tried to trade Keith Barney out of him for any three officers he wanted to pick and he said, "If you want him that much, I'll keep him." And he so organized that general service regiment that no one in one battalion outranked Finley, so that Finley became battalion commander, and to the best of my knowledge when the war ended, Finley was a lieutenant colonel commanding that same battalion.

As for the 79th Engineers, we had a tough time. There were no weapons. We had to make wooden rifles in order to do any kind of tactical training. We drew something like 21 M-1s to qualify the entire regiment in the blizzards, and snows, and sleet in Kansas. Nebraska blew by one day and Oklahoma and Texas the other! But we did qualify them. I learned a little about conscientious objectors. On the rifle range the chaplain came up to me and said, "I'm sorry but we have a conscientious objector here and he won't

shoot." And I said, "Well, does he object to shooting at a paper target?" He didn't know. so I said, "Okay, let's go." I put the chaplain on one side and me on the other, and we discussed it with this young man. He was fairly sincere. In fact I think he was sincere but he hadn't known how to declare himself until now. But he thought that if he even shot at targets, this would indicate that he was getting ready to shoot at something more, which made a certain degree of sense. I finally told him, I said, "Look, what we're going to do, we're going to talk to you, and I'm going to squeeze your finger, and that thing is going to go off. And when it goes off, it's going to scare you, but you're not going to be shooting at anything. You're just going to be shooting. If you'll then try that a few times and find out you can qualify, if you get qualified, I'll put you in the medical detachment where you won't even be issued a rifle." Sure enough, we got him qualified. The chaplain talking on one side and me squeezing on the other until he got to the point where he was willing to do it, and he qualified himself and was put in the medical detachment, and that's the last I heard of him. We never got any reasonable amount of equipment during the time I was with them. We finally got rifles along about May. We were changed from a combat regiment to a combat group, the 1113th. One of the worst things they did to us was take away our band. We had developed a great deal of morale striding along behind the band singing a song called "We are the 79th Engineers." But when we got converted, we lost the band.

About the first of June I received a phone call from the Chief's office, the personnel division, and they said, "We've got good news for you. We're going to send you to the first course of the joint Army-Navy staff college." I said, "Well, what is that?" And they tried to explain it to me. I said, "How do I get out of it?" And the answer was, "You don't." "Well," I said, "this is -- I've been training this combat outfit to go to France, and it's pretty near ready. Why not go?" They said, "Let us explain the requirements. The requirements are for a colonel or lieutenant colonel of Engineers under 40, experienced in amphibious operations, and you're the only animal

of that type alive in the United States continental limits today." And I said okay, there I go. They said they'd try to save the 79th -- the 1113th -- for me. I got through with the course in September, and they made a valiant effort, but I'll come to that portion later. That took me away from Salina and put me in this joint Army-Navy staff college.

Those are the two things we passed over yesterday. One thing more. Some of these things led me to develop a policy or principle that I have been trying to sell ever since, particularly in dealing with young officers. That is: have intellectual curiosity. Take advantage of any chance to see what the other guy is doing. I am particularly referring now to within the Corps of Engineers. You'll have troops here and a District over there, and these people don't pay any attention to what these guys are doing and vice versa. And I say just next week you may be there and you may be here, so take advantage of every chance to go visit projects, troop exercises, and talk with them and find out what's happening. Get interested in stretching your own head a little bit about such things as geology or permafrost or water. I'm not saying to spend a lot of time studying it, but just take advantage of the opportunities to run into it and find out a little bit. Later on, as deputy chief and Chief, I promoted that particularly while visiting troop units. I'd say, @'Well, you're missing a chance. There's a chance to see a big job in operation, and they'll answer your questions. They'll show you around and be pleased to have you. And if you stay in the Army and the Corps of Engineers, someday you'll be running or building one of those things."

Q: That's a good philosophy.

A: That's just something I think you ought to keep harping on.

Q: . Yesterday when we ended, you were talking about your assignment to the Army-Navy staff college. I wonder if we could move on then to your assignment to the Southeast Asia Command and how you didn't get back the command of the 79th Engineer Combat Regiment. I have some specific questions to ask

you about Southeast Asia when you get to that. You might begin by saying something about the purpose of the Army--Navy staff college, because you were in the first class.

A: I got up there in early June and my family went home to Alabama. The course was a brand-new development. It changed pretty radically after that first year. They started us at the Naval War College at Newport, Rhode Island. Then we went to the Air Force field at Orlando, Florida, where we concentrated on the Air Force side. Then we went to Washington and our classes were conducted in a building originally built for the Chief of Engineers and taken over by the War Department and subsequently by the State Department. They put us to bed in an apartment just two blocks away near the Lincoln Memorial, so we were right there together. It was a four months' operation -- one month at Newport, one month at Orlando, and two months there. There must have been about 50 people in it.

We went to the Naval War College and this was an eye-opener because if there was anybody dyed-in-the-wool, if you want to call it that, or fixed in their ways in those days, it was the Navy. It was quite a shock to some of us. There was a way to do it and that was it, period. But it was a good training for all of us that were there. You were forced to rub shoulders and noses with the other people, and you could begin to understand at least a little bit of why their concepts and strategy and tactics were fixed in certain lines.

Q: You mean it was a real contrast to the Army's school at Leavenworth?

A: To me it was. They hadn't gotten up to the modern era as far as I was concerned. At least I didn't think so. You did it their way, or you didn't get the support, that was it in their minds. It was interesting, it was at the source of a lot of the business. Now this was in the summer of '43, so this was the time that the war in the Pacific was getting pretty hot. We had just gone back as far as we were going and were starting to come the other way. There was considerable controversy in those days between the South Pacific and the

Southwest Pacific, between MacArthur and the Navy command. The Navy commanded the South Pacific and MacArthur commanded the Southwest Pacific, and they were competing for means and goals and everything. It was a time when most of us would have liked to have had somebody come along and say, "This is the way it will be done, here's the way to do it, and this will work," because we didn't know. It was pretty touch and go.

We went to Orlando next. My family went down to the beach at Daytona, and I got to go over there for a couple of weekends, for Saturday night and Sunday, which was nice. There they more or less pointed our noses down the line of the Air Force's concepts, some of which I had gotten at Leavenworth, because in those days the Army and the Air Force were one. but this was a more concentrated deal. Then we went for two months to the school in Washington. There the concluding operation was about one month of dividing the class into three different committees, each committee headed by one of the services--Army, Air Force, and Navy. The rest of us were scattered around in there to balance it out.

What was intriguing to me, the exercise was staged in the Pacific, and we were to find out how to take a place there that was not yet taken in fact but that it was obvious was being considered. So we felt we were at least working on something pretty live. The interesting thing to me was that after all this three months of effort trying to broaden us, and we get through and we present our three committees, they came out with an Army plan where the Army man was the chairman, a Navy plan where the Navy man was the chairman, and an Air Force plan. It was obvious that we needed this effort to put us together because it wasn't easy. But to me, studying that and working on it as hard as we did, it made me admire even more the way MacArthur and his crowd bypassed and developed, hopped, and made tremendous progress moving up there without running head-on into the kind of thing that we had been faced with. If they'd have tried to take this place I'm talking about it would have been tough--it was one of the Japs' better defended areas, and it was bypassed. It died on the vine about a year after being bypassed. It was quite a lesson as far as I was concerned.

But then as we got near the end, and I'd been keeping in touch with Johnny Hughes, who was the Engineer for the ground forces at Fort McNair, and he was telling me that he was saving the 1113th Group for me.⁵¹ If I could get free, I could take it to Europe. One day about the first of September--this course ended about the middle of September--I got told that General Wedemeyer wanted to see me.⁵² I knew who General Wedemeyer was. He was in plans in the Pentagon at that time. He was a brigadier general and was pretty well known, but I didn't think he even knew who I was, and he probably didn't. I reported to his office and he sat me down and said he had some very interesting news for me. He had just come back from Quebec, where there had been a conference with the British, a combined chiefs type thing, and Mountbatten had been there, and they had decided to set up a new command out in the India-Burma-China area, Southeast Asia Command.⁵³ This would be commanded by Admiral Mountbatten, and there would be a joint staff--Army, Navy, Air Force; British and American--involved. There was to be a British major general of Engineers as the engineer in chief, and his deputy was to be an American. It would be set up in a slot for a brigadier general, and would I like to go with him and fill that slot. I said, "No, sir." He said, "What? Why?" I said, "Sir, I activated the 1113th Engineer Combat Group, and I got them ready, and I thought we were going to go win the war in Europe. They're holding it for me to go back to, and this to me is more in line with what I have been spending my life getting ready for." "Well," he said, "let me put it to you differently. General Marshall has decided that every graduate from this first joint Army-Navy staff college will go to a combined staff. There is a requirement for an Engineer officer to fill this slot promptly. You are the only Engineer officer in this class. It might lead to being a brigadier general very promptly." (And I didn't believe that.) "How would you like to go with me?" And I said, "I'd love to!" So that's how I got with that and it all leads back the same trail.

Q: Do you mean that you had been preparing for a combat position rather than a staff position?

A: I mean a command of a combat unit. You always thought in terms of, well, someday I'm going to be the division engineer of the such and such division and command that regiment. But I never quite made it, and I was always disappointed that I didn't get to do that, because that's what you had been training for, at least I thought you had. This is again where I was trying to control my own career very unsuccessfully, and the way it turned out it was completely in my interest.

Q: What were the major activities you were involved in in the China-Burma-India [CBI] theater? Didn't you go to India, where Desmond Harrison was the British major general above you?⁵⁴

A: Well, everything was hurry, hurry, hurry to get there. The course ended and we had a couple of weeks leave and then collected in Miami to get on the airplane and fly over to win the war. I got to Miami and sat around for a week or so waiting for a ride. I had some other friends there, and each day we'd think, well, if they're not going to send us out today, let's go rent a boat and go out deep-sea fishing. But each time we thought we had better be handy for the call. So we finally got going. We went down through South America and went from Natal to Ascension Island, which was sure just a little spot of nothing, and then on up into Accra. Then we got on a C-47, and we went from there to India, which took one heck of a lot of stops. We never spent a night. We had to sleep in bucket seats. We stopped for a meal once in a while and a bath, but we just kept going. We got to Karachi in Pakistan, and we thought, now we'll get right up to New Delhi, but we just stayed.

After about three or four days we tried to find out what was happening, but it was the old hurry--up-and-wait deal. Finally somebody got wind that we were down there, and so suddenly we flew into New Delhi. So I reported to this British major general. About that time General Wheeler, U.S. Army, who had been out in that theater, had moved over to Southeast Asia Command as the principal administrative officer (PAO), and General Harrison served under him, so I was in that chain.⁵⁵ I didn't stay in Wedemeyer's chain. Wedemeyer was in the military planning side.

I reported to this British major general and his first question to me was, "When are the rest of your staff coming?" Well, Wedemeyer had assured me that we were not going to take many Americans. We were going to let the British carry the ball on this. So I said, "You're looking at him. I'm it." He said, "No, you are not. I've been serving with your folks over in England, and you have far better Engineer construction people than we have. We're pretty good on troop planning and so on, but you're far better than we are on the other. So what we're going to do, you're going to try your best to get people who will fill these slots in this organization, and the ones you can't fill then I'll fill from the British side, but we'll get as many good Americans as you can." This was a complete reversal from what I thought, but that's what we tried to do, and we got a pretty good-size staff and some pretty good people.

I was his deputy, and he was a good guy to work for. He tried to smooth me over some in spots, but he also backed me up frequently. It was pretty tough because not only was I now into an international organization, but I was into one modeled on the British Royal Navy, and they weren't a bit different from what I had run into up in Newport. Their method of running a headquarters on shore was just as if you were on a ship. I mean every night they picked up all the classified papers of any kind and locked them in a safe. Not individual offices, just the central one, so that the next day it would be an hour or two before you could get your working papers back in your hands.

They had systems which were awful hard for we Americans to accept. They had a basic principle of writing a memo or staff paper or something and then sending it around. And everybody would add a little note, and they called it a minute. They were running out of everything in India in those days. They ran out of paper clips, so they used thorns. The main supply in this was through the British channels. They used little slips of paper. They had a string with a little piece of metal on it. You stick the metal through the paper and then you would turn it flat and it would hold it. There would be a big stack of minutes. They were all done longhand so that I couldn't read half

of them, and I couldn't tell who had acted on anything. To me it seemed these things just kept circulating. I never saw anybody take action on anything. It was somewhat of a surprise.

One day I decided I was going to correct this, so I found a paper that I thought was something we ought to do something about right then. So I took all these little pieces of paper and threw them in the wastebasket, and on the basic paper I directed that we do so and so. And it took them about a month to straighten that out. I guess I probably got my lesson from it, but at any rate they kept right on using the same system, so I didn't gain much, but we began to understand it better. They wanted to do well.

Our PAO in the engineer division was British, what I would call a warrant-officer type, and he had been indoctrinated in the military so long that it was some deal; you had to learn how to live with it. It was a little hard to learn how to live with it, but I finally deduced that the main thing Southeast Asia Command could do to help us really win the war was to see if we couldn't support the U.S. forces that were trying their best to get over to China. In my position I'd have some chance of working on the government of India. It was a separate entity, but it was responsible for supplying the logistical support. Southeast Asia didn't command the government of India. It was a guest there, but it had to call on it for help. The U. S. side was sitting there, and it didn't command the government of India. The government of India ran their military and everything, just the way they had always run it.

You've heard of the expression "red tape." Well, I saw how that got started. I went to call on the engineer in chief, India. His offices were a one-story deal, concrete block, probably had been there about two years and probably nobody had whisked a feather-duster around in that time. They had tables instead of desks, and underneath the tables there were stacks of documents tied up with red tape, literally red tape. And every place I looked and every office I went into [there] were these stacks of papers. Who knew what was there, I don't know. But there they were, tied up neatly,

and India's not a very clean place: the dust on it was thick. It really shook me. You had to learn how to work with them.

Q: Was it largely due to pressure from the Engineers that the Indian government acted?

A: I think we did some good. I worked primarily with [the British] Brigadier Billy Hastead, he was slightly older than I and was the deputy for Air for the government of India's military engineer in chief. He could see the point; I could see the point. I could go from him to the Engineer section of the China-Burma-India command, which was American, in New Delhi and kind of work them together. It wasn't easy, but we did accomplish some things.

Q: How did it work having Engineers at so many different levels--in the Southeast Asia Command and under General Stilwell, and so forth?⁵⁶

A: Theoretically at the top, although it really wasn't the top, was Mountbatten. He was the junior commander in the whole area in age, and he had Southeast Asia Command. He was Supreme Allied Commander. But his forces that he truly commanded were a British general, the oldest general still on active duty in the British army for the ground forces; the oldest air force flier for the RAF [Royal Air Force] support; and the oldest admiral. It was a committee and they had to, you had to get them all together, and to make it worse, Joe Stilwell was Mountbatten's deputy.

Q: Was Stilwell's position clear?

A: Oh, yes, it was clear. It was very clear, but he didn't give a hoot for the British. I think he visited Mountbatten's headquarters twice in two or three years, and he was his deputy: He was very suspicious of anything they tried to do, and I guess probably it worked both ways. He could have been involved more, but I don't much blame him because nothing was happening. You couldn't get this committee to produce. The basic thing is the British were a damn sight better in planning the details of an operation. We were going to take some islands over there in the Bay of Bengal. We



British-American Cooperation in CBI. Major General Raymond G. Wheeler (r.) consults with his boss, Lord Mountbatten.

were going to do this, and we were going to do that. And each time the Southeast Asia Command staff would come up with the requirements, which were so tremendous that nothing happened, you couldn't do it.

Where on the other hand, generally speaking, the Americans would do a fair job of planning what was required, if they didn't have enough, they'd make do with less. And they'd go ahead and start, and maybe they'd get clobbered, but at least something would happen. Two or three times we got organized for some exercise, for a real war effort, and just then they decided to cross the Mediterranean, so they took all the shipping away. So it was a very frustrating experience for the Mountbatten-level people and a lot of the rest of us because every time we'd have something that looked like now we're finally going to do something, something would come alongn-there'd be a storm, a bad battle someplace, there'd be a requirement for shipping someplace--I didn't know when they were going to land in Europe but of course that withdrew all the shipping again. You had Southeast Asia, which was theoretically the overall command. But in fact, frankly, Mountbatten couldn't order Stilwell to do anything. He just had to try and suggest, promote. I don't think he could really order any one of these three major subdivisions to do anything. He had to get them together. It was frustrating for Wedemeyer. His job was to draw up these plans.

Q: How would you characterize Mountbatten? How did he get the command?

A: He was one of the best people I dealt with. He had personality, and he had intelligence. He was a charming guy and a good-looking guy, and he had been a hero. He had been a destroyer commander and had it shot out from under him. He had been in their combined group that landed on hostile shores.. He had been in on some of that kind of business. He had a name on the British side. He was also a cousin of the king of England, which didn't hurt. He was Prince Philip's uncle, but Mountbatten himself was related to the king, closely related. I knew Prince Philip there as a young staff officer.⁵⁷ A blonde, good-looking

young man in Ceylon. He was there. Mountbatten, if really given full authority and a willing group of subordinates, probably could have accomplished a heck of a lot more. On the other hand, I don't think the Americans would have acquiesced to giving him that.

Q: Stilwell had a theater engineer, and there were engineers in the Southeast Asia Command and in the Indian government. What was the relationship among them?

A: Here's what you had. The government of India owned the territory, owned the manufacturing means, owned the labor means, and it owned the railroads. It was the government. It had its army. It had a commander in chief, India. They were there. They had gone through the brunt of the early days. They had supported what little effort had been made. They'd backed up Burma to the extent it had been done. They had taken lickings. They had been expanded.

Now on top of them you then superimposed the American forces. They are living in somebody else's land, and they looked to this somebody else to give them much logistical support and help with rail movements, everything. If they wanted to establish another camp or facility, they had to go through the procedures to get the government to agree and let them have it. But they're a pretty big presence. As a matter of fact, they're probably almost as big as the military belonging to the government of India.

Then you come along and superimpose on all of that this new Supreme Allied Command with theoretical command over all of them, coordinating control, but actually it had to more or less operate by getting agreement. So we had an Engineer officer in the person of "Speck" Wheeler, who would get to be a lieutenant general. He was a deputy to Mountbatten also on the administrative side, which is basically the logistical side, but he was basically an engineer. You had this British major general of engineers who was an engineer.

Our SEAC engineer division was itself a great mixture of British and U.S. engineers, Australians,

New Zealanders, Canadians--troop specialists, intelligence types, planners, and doers. And we couldn't throw our weight around. If we did, we would get everything screwed up and nothing would happen. But we had to try and get our people to operate on a low key and use suggestion and persistent effort.

Then shortly, after we had been there about six or eight months in New Delhi, Mountbatten got fed up and decided he would move his headquarters down to Ceylon, where he would be a little independent of the government of India and things might cure themselves. Well, this was fine. I went along with him. We all rushed down there. We lived in a teagarden. It was very nice, a nice climate and so on, and was halfway up the mountains down there.

We hadn't been there very long before I got called in and told, "Well, nothing's happening. We're losing out. We've pulled everybody out of New Delhi. We've left British Brigadier [James F.] Benoy back there, but you're missing.⁵⁸ You were doing more good to us back up there working with the Americans and the government of India engineers in getting things put together and moving. So we're going to send you back up there as the rear echelon. You'll have Craig Smyser, who is an American Army Engineer, but you have got to go back and work with **Benoy**.⁵⁹ He's the official rear-echelon representative. You just work with him and see if you can't get more of this support that you were developing before." So I went back to New Delhi.

The first time I was in New Delhi I lived about a month or two in the big hotel. My roommate was a classmate, Frank Merrill. But along about a month after I had gotten there, they decided to set up this special combat force, and he got moved out to go take command of it. Colonel [Charles N.] "Reuben" Hunter had already brought it over there and organized it. Frank was one of Stilwell's boys, so he went down there.

Then I got moved to a palace, Bikaner House. Mountbatten lived in another beautiful place, which incidentally had a bedroom with mirrors covering

the ceilings and the walls. It was something. The maharaja that built it wanted to be able to see who he had with him from any position. [Desmond] Harrison lived in the same palace with Mountbatten. Craig Smyser and several of what they called senior officers, most of them brigadiers or major generals, also lived at Bikaner House. There were just a few of us that were still colonels, Americans in particular. This was a beautiful palace, marble with tremendous high ceilings. I got ranked into the senior son's quarters. The rest of them didn't realize what a break I got because it was off on one flank of the palace, separated pretty much from the rest of the building, and it had hot water, its own hot water heater. Every other lieutenant general and major general and everybody else living in that place, their bearers had to go out and heat their bath water over a charcoal fire, but I had an electric hot water heater, or gas, I've forgotten which. But cold! It's kind of like this climate here [in Mobile]. It gets down around 30 [degrees] here and if you don't have any heat it's cold. Well, that marble palace was primarily used as a home during the summer by the maharaja of Bikaner. In the winters he was in his own bailiwick--there wasn't one sign of heat in this thing. It was just plain cold. We ate in a British mess. I asked one day, "Don't we have a mess officer?" And they said we did. 'How often does he inspect the kitchen?' I asked. They said, "He has to eat here!" Well, that was serious. So I normally had "Delhi belly" every Monday. Our offices were in what I see on the TV whenever we have people go and visit--big red stone buildings up where the legislature and government offices were--and we had some of that. My main transportation was a bicycle. I rode three or four miles on a bicycle. That was fine in the winter but in 120-degree temperature it got a little bit hot. But it was certainly a lot better than living in the jungle like they were doing in some places. So we had nothing to complain about. Now I am off the track.

We were talking about all the different Engineer commands. Now let me see. Tom Farrell ended up as the Engineer for Stilwell.⁶⁰ Dan Sultan later on was Stilwell's deputy in Delhi, and then Stilwell

was removed, and Dan Sultan took over.⁶¹ He was an Engineer officer, too. Tom Farrell, Al Welling, oh they had quite a crowd of Engineers there.⁶² As I say, Craig Smyser was working for me, and he escaped and went over to the Farrell Engineer section, where he thought he was doing more good. Probably he was. Lew Pick got over there about the same time I did and took over the Ledo Road. He was an Engineer, and most of his key staff were Engineers.

Joe Cranston had been the Master of the Sword, which is the athletic director, in essence, at the military academy when I was a cadet.⁶³ He was commanding the intermediate section, but it was full of Engineers as well. Neyland, football coach from Tennessee and an Engineer, who had retired and was called back--was commander of the base section in Calcutta most of the time when I was there.⁶⁴ He was an Engineer. It was an Engineer theater. I can't say it was any well-thought-out approach to life, but I more or less tried to stay out of people's way, and get in on the conferences as much as I could, kind of ease in the long-range direction of what my bosses were aiming for, but not make a big noise, if you know what I mean.

And this turned out to be right successful. As a matter of fact, when the war ended, Speck Wheeler became the Chief of Engineers. I'd gotten to know him very well because I used to go out and wait at the airport to meet him. In fact, he woke me up one time when I was sleeping on the back seat of the car. And he said, "What's this, you're worse than the apostles of Christ going to sleep:" But when I came back from the war, here's this man as Chief of Engineers. Lew Pick--I had made a lot of visits to his territory, I tried real hard to get him the things he needed--I don't think he particularly paid much attention to me or knew much about me--but I never did cross him. I sat in up there at some conferences when we were trying to settle between the Air Force command and the Army command--who gets some of these Engineer battalions that are coming? Because there were some of them coming over there that were labeled aviation engineers, and the Air Force wanted to control them. But everybody in the road area wanted to control all of them and to allocate effort. I

remember sitting in the back of the crowd very quietly watching Lew Pick do a darn good job of winning his way over that thing, which I thought was the right way anyhow. We didn't have enough of anything -nobody had enough.

Q: Are you talking about the movement to centralize the Engineer construction effort rather than let it be--

A: Frittered away.

Q: Yes, and doesn't this have to do with the Air Force rivalry? For example, there were the roads and there were the airfields, and the Air Force wanted to have control.

A: That's right, and the big thing was, shortly after I had gotten out there, they started preparing to receive B-29s.⁶⁵

Q: Was that one of the biggest projects?

A: Oh, yes. It was a hell of a project. And they sent all kinds of people over there, engineers of one breed and another, to get things ready. And they *were* going to come pretty soon, and they wanted to be able to hop from down near--from Bengal, down near Calcutta--they wanted to be able to fly over to some new fields to be built up at Chengtu. They wanted to be able to fly with their bomb load, land up at these fields that were to be built up in China, top off with fuel, fly over, and bomb Japan, come back and get fuel, and come back down to the Calcutta area. At that time none of us knew a thing about the B-29. We didn't know the characteristics. We didn't know what thickness of pavement was needed. It turned out that one of the Air Force types had all of those specifications locked in his drawer, but he hadn't thought there was any necessity to let some of the rest of us mundane folks see those kind of things.

Q: Were you supposed to go ahead with construction without any further specifications?

A: Well, the answer was, in my case, I was just up here. I just knew it was happening. People would say, "We're bringing this in, help them all you

can." We had to twist the arm of the government of India to get the sites. Then the promises were to send U.S. battalions over that were to build these fields with no problem. It wouldn't be any drain on the government of India at all. It wouldn't be any drain on the rest of the military effort. They'd come complete. Then the word came, "We can't get them off yet, but we've got to get started. Can you do anything to get the government of India to go ahead and start building these fields?" This just didn't come to me. I was just getting it on the part of the whole crowd. Well,, they had no equipment. And, as far as the Air Force was concerned, this was going to win the war. Suddenly we had Kromer and some other American engineers showing up to build airfields down around Calcutta, B-29 fields, without hardly any means except bodies. And where was the labor coming from?⁶⁶ We were going to get the engineer service of the government of India to furnish labor and little mixers, hand mixers, to mix the concrete. It was fraught with troubles. It couldn't move fast enough. It couldn't build to the specifications our Air Force wanted. The other people thought it was just crazy to demand so much strength and so on.

But by a great deal of cooperative effort, not just of our Southeast Asia Command, we got the U.S. theater, and Billy Hastead, the Air Force engineer for the Government of India, together. He worked under the engineering chief, who was a grade or two higher. Hastead saw the point, realized the requirement, and helped us no end. I think I was somewhat influential in helping get him pulling in the right direction. But, if you can believe it, we were trying to build four or five big fields with tremendous runways for those days, with nothing but pick and shovel and little trucks and concrete mixers. They had some rock--crushing equipment. A lot of it was done by hand. But they had to have a whole battery of the things lined up in order to do anything, and it was not fast. Yet the Indian side had been more or less forced to accept the target dates and get going when it was really obvious that they couldn't possibly meet those target dates under any circumstances. This caused every fly-by-night that came through from the Air Force, including my friend LeMay, who would

jump all over the fact that it was those damn Indians that were so slow in this.⁶⁷ But the promise had been that the Engineer troops were going to arrive in a package to build these things.

Q: But what happened, didn't they have the troops?

A: They didn't have them, and they didn't have the shipping.

Q: Was that true of the equipment, too? Why didn't you have the equipment you needed?

A: Well, the reason was because the effort was going faster than the logistical system could bring it. And the real thing, you see, you were in a competition. They wanted that same equipment out in MacArthur's theater, and they wanted them in Europe, and they wanted it in the South Pacific. We were pretty much near the bottom of the totem pole. We got just kind of token deals pretty much. Now that's not quite a fair way of saying it.

Q: Your whole effort was related to the position of China against Japan, to strikes out of China against Japan. It sort of rose and fell according to that relationship, didn't it?

A: That's right. Remember now that Stilwell had no respect for the British, in fact no respect for the Chinese either, to amount to anything Incidentally, I had known Joe Stilwell slightly since I had been at Benning. The more I saw of him and the more I saw of the war, the more I realized that he was one of the finest infantry battalion commanders that we ever had, but quit right there. For background, my father in 1941 activated the III Corps in Monterey, Fort Ord, and who should have the 7th Division in the III Corps but Joe Stilwell. As corps commander my father used to go over there pretty frequently, and he said he never found Joe Stilwell any place but out marching near the front of the point of an infantry maneuver some place. He never saw him near the artillery, near the Engineers, near the division logistical side, and this was borne out very much by what happened. "Uncle Joe" was happiest when he went out under a banyan tree in Burma surrounded by a handful of his pals and conducted a little combat war, which he

did well. His deputy back in New Delhi was never quite sure what he had decided, what he was doing. It wasn't the best run operation in the world. On supplies, that was halfway around the world. It took them a terrible long time to get supplies. And when you got to India, you put it on rail, and you had to switch from one rail system to another, you had to get on a ferry, and across a river and go on a different gauge railroad.

Q: Were you involved in any railroad work?

A: Just in the general deal that the railroad was there and was serving the effort, and our general mission was to see to it that everything got up to these forward areas that was necessary. Paul Yount was sent over there, another Engineer officer, the same one who had been out at Schofield Barracks with me, and he was brought over from Persia to run the railroads, and he improved them no end.

Q: What about your involvement on road construction?

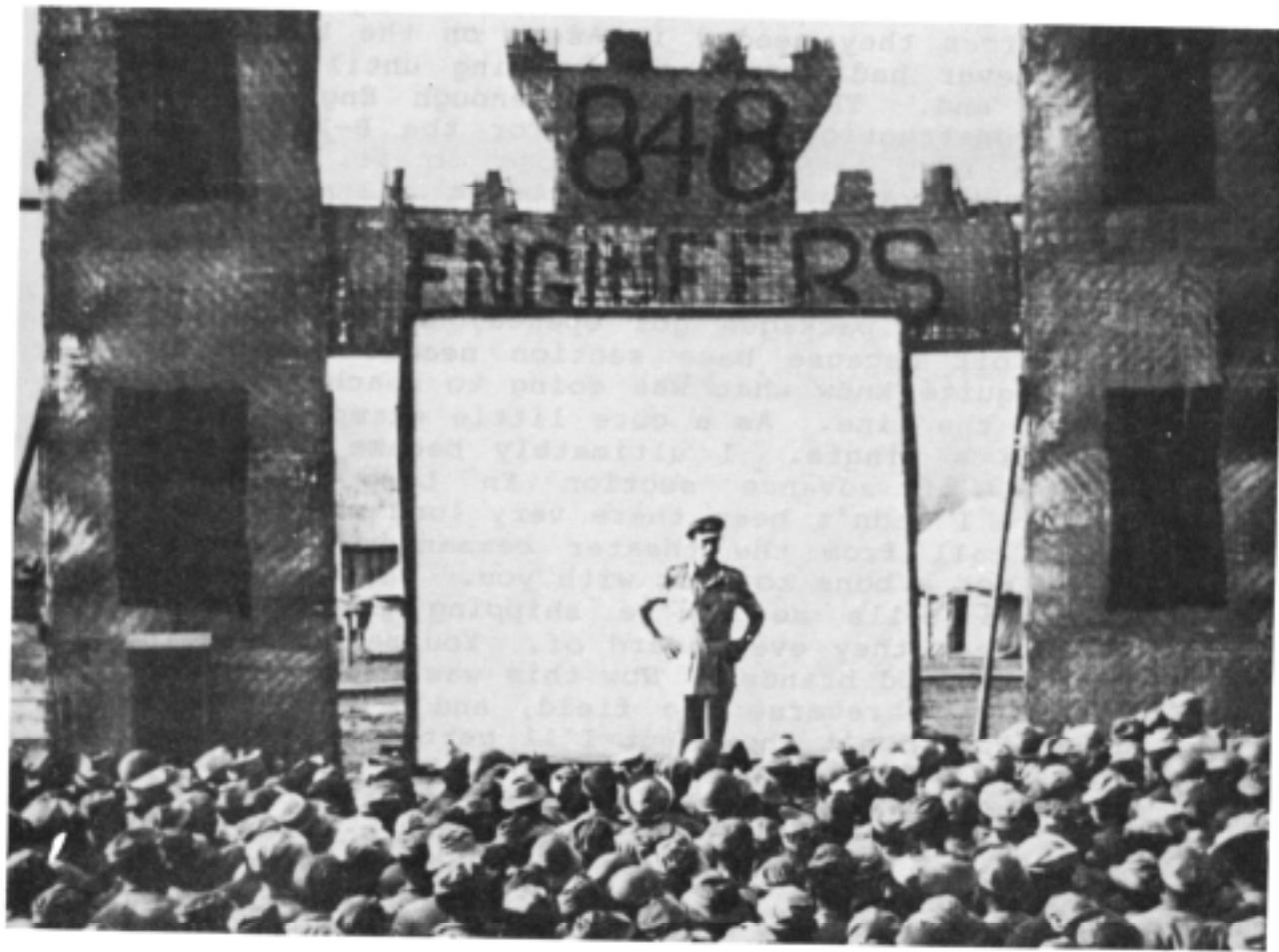
A: The thing is, I was involved in all of that but only from the viewpoint of higher headquarters, and from my own initiative only from the viewpoint of how do we help. I'm not going to fight them or argue with them. How do we help them get it? Who can I go see, or who can I send a staff man to? How do we maintain contact in order to accelerate it?

Q: Did you get involved in the controversy over the Ledo Road, where it was to go?

A: No, nobody asked us. In fact we would have been stepping on the U.S. theater's toes if we had done so.

Q: What was your relationship with the Air Force and the Services of Supply?

A: This is all part of this picture I'm talking about with the B-29s. Again, I couldn't order anything. I could sympathize. We could send messages back supporting. The best thing we could do was to try and get people who had the means together with those who needed the means and talk them into getting together and moving, and they did. It was



Lord Mountbatten addressing Engineer troops in CBI.



Breaking Out of the Hills into Burma. Wilson (r.) with Major General Lewis A. Pick (c.).

slow, but it was an improvement. They never had the forces they needed in Assam on the Ledo Road. They never had enough of anything until the very bitter end. They never had enough Engineers or good construction capability for the B-29 fields. And as fast as they got close to it, then the emergency got over and you began filtering that stuff off someplace else. We had a terrible amount of equipment requirements, but it had to come ashore in Calcutta. Sometimes it got broken down, some of the packages got opened, and things were taken off because base section needed them. You never quite knew what was going **to** reach the other **end** of the line. As a cute little example, let me digress a minute. I ultimately became commanding general of advance section in Ledo [September 1945]. I hadn't been there **very** long when I got a phone call from the theater commander. He said, "I've got a bone to pick with you. Base section in Calcutta tells me you're shipping them all the worst beer they ever heard of. You're not sending them any good brands." Now this was when they were **starting to** reverse the field, and I said, "Well, general, I don't know, but I'll certainly look into **it** and I'll call you right back." He said, "Okay, you do that." So I asked my staff if this had **been so**. They said, "Yes, **sir**, that's absolutely right," and I asked them why. "Well," **they** said, '@we were the ones out front to begin with up here. And the first two years over here Calcutta never shipped us anything but these no-name beers. That's how we built up this stock. Half of what we got would be this stuff, and it didn't sell, and it had just been stacked up in the warehouses. So now that we're going the other direction, we thought we'd send them that back first." I said, "That's fine. Let me check it through." So I called the theater commander and he said, "Is that a fact?" I said, "Yes, **sir**." He said, "Well, just keep right on doing it that way then. At least for the next war, they'll get the lesson?

This is just a small point, but it happened. How things got done was more or less in **spite of the** organization to a large extent, and **a lot** of people **putting** out a whole lot of effort. I don't want to give you the wrong impression that the government of India forces weren't trying, because they were. Particularly this Brigadier Billy Hastead would come through and try.

But the worst of it was they would make a terrific effort and rob some job of their own that they thought was important also down there, and then some Air Force fly-by-night would come in and just raise living hell because there wasn't any more progress. They'd say, "Look at these 'wogs' [Indians], they can't do anything by hand. How do you expect to get anywhere?" Well, the answer was everybody was doing the best they could.

Now the Chinese were required to build three bomber fields and a couple of fighter fields in the Chengtu area, and they had no equipment at all really. They had no asphalt. They had no cement, and everything that got up there had to fly over the hump, and flying over the hump was a pretty slow process. They said they were going to build those fields in three months. It was taking us two years to build them down where we were worrying with it. They finally got started on them, and they built the damn things in three months. But what fields! They would go to a village and say, "I want 10,000 workers tomorrow." And 10,000 workers would show up the next morning and they said, "Okay, your job is the side of that hill over there. You break out the rock and carry it over and dump it over here." And another 5,000 would be told, "You take it from here and go along the runway and break it into little pieces." And they had 30,000 people working on one field, and they did it. They built homemade rollers, big concrete rollers. It took about 40 to 60 men to pull them. That was the motive power, and that was their compaction means. But they built the damn things, and the Air Force flew them. They got their fields finished before we got the ones down in Calcutta. The Air Force started flying, and they'd land, and they successfully did it. After about a year those fields were just absolutely hopeless. By that time the war had changed anyway, so they just quit.

Shortly after I had gotten there I decided I better get over to China and see something for myself, CBI theater. I got permission. I had orders that said I could go anywhere. So I went up to Chabua, which was the takeoff point for most of the hump flights, and tried to catch a ride. It was pretty tough because going that way everything was full. But I found a friendly Air Force pilot who said, "If you

want to go on a supply plane, I can let you lie on top of a bunch of airplane tires and stuff like that." That was all right with me, so that was how I first flew the hump. There was no heat, and it was cold, and every now and then the crew chief would open the door and walk back and take an oxygen thing out of his mouth and say, "You want to suck oxygen?" And I said, "No, thank you, I'll try without it." But I flew to Kunming and went around and saw a little bit, went down to the Lingling, Kweilin area. I spent about a week there. This was about January of '44. I hadn't been there very long when it was obvious that I had to get out because the Japs were coming with a major offensive drive. We had been in much better shape in '43 in that part of the country than we were in '44, so I had to fly on back and get to where my knitting was. But it gave me a chance to see a little of how things were done there and what was necessary and sympathize with them.

Q: What do you think was the greatest challenge from an engineering point of view--the roads, the airfields, or the pipeline?

A: Oh boy, that would be a draw because they were all interrelated. You had to have the airfields to get supplies up there. You had to have the road to build the pipeline and keep it operating. You had to have them all, and they were all tough. The big difference was that up on the road you actually went through a combat period there where the road was pretty well under frequent attack. Then they robbed two or three battalions from up there and turned them into infantry and threw them in the battle in Myitkyina.

Q: In which area do you think the most success was achieved before emphasis shifted away from the China-Burma-India theater?

A: Oh, it's all interrelated. The flying boys had the best time because when they got someplace they usually had a dry bed and a warm bath. The people that worked on the road had some pretty tough life. To me it was amazing to see as much accomplished as was accomplished. That was some rugged terrain. I made every trip I was able to get away with up to look at what was going on and see the works.

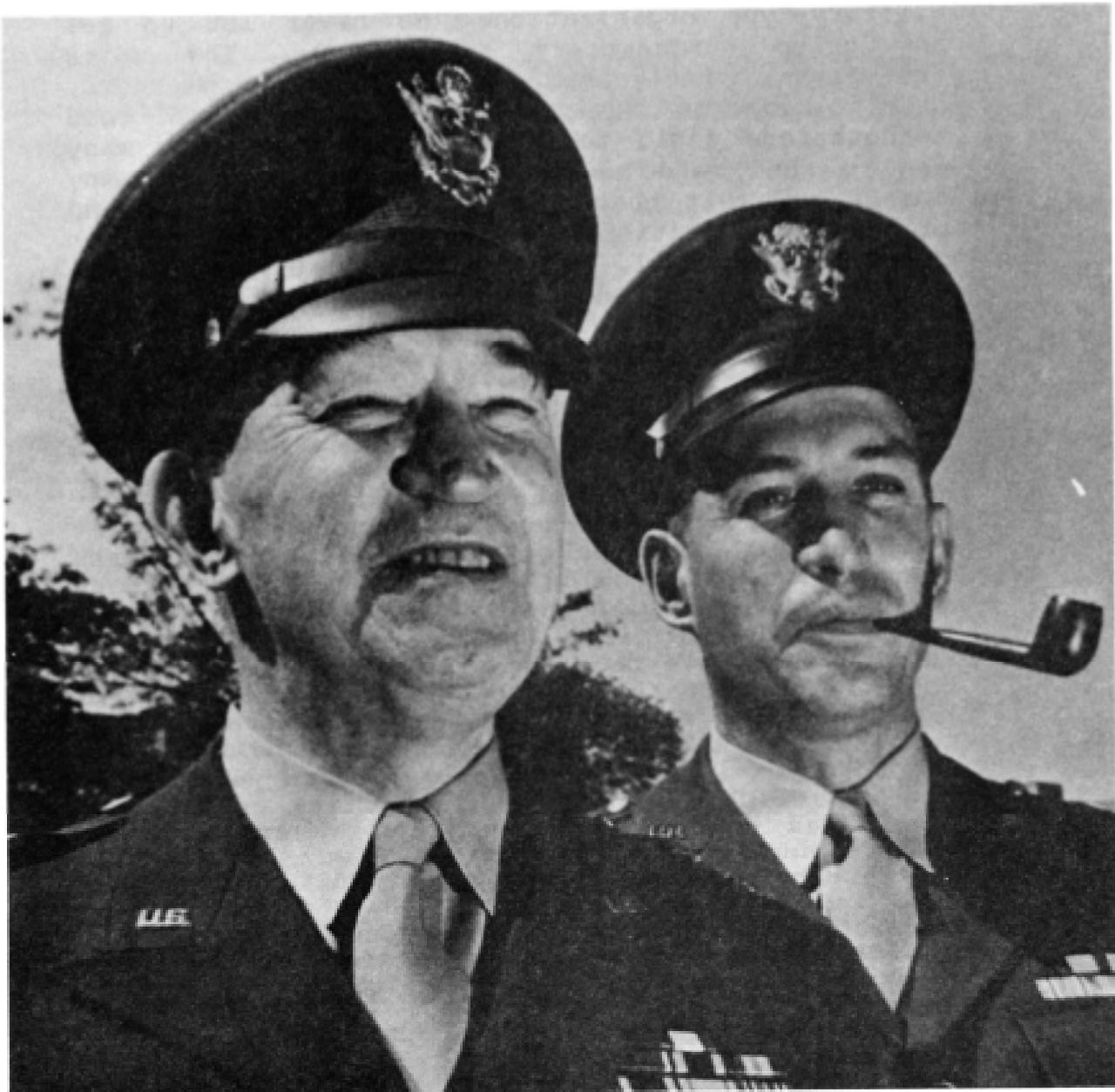
In building his road, Lew Pick established what a lot of us called the gestapo road headquarters, which was more or less independent of the military-type organization. He never let us get any group headquarters over there. The units themselves, pretty much the battalion commanders, were owners of equipment and people, and road headquarters would tell them what to do, how many men to send, and how many vehicles, and how many dozers. I felt that we had developed a group and brigade organization that could do a better job over the long haul, but Lew Pick could make people work. He really produced results.

Q: He really set up some pretty short-term completion goals, didn't he?

A: That's right, and he got them working. He knew how to make them work. I don't know, maybe that is what was necessary in that neck of the woods. But the pipeline couldn't have been built without the road there to a major extent to get the materials there. The road couldn't have been built without air support and quite a little. Do you realize how far some of that is? The trip from Calcutta to Kunming must have been the same as going across the total United States. You changed gauges several times on your railroad. When you started out of Ledo to make the road trip you had a helluva long way to go on a gravel road to get where you tied in to the old Chinese road, and that was even worse. So it was not an easy operation by any possible means, and there wasn't any way of really short-changing it. The Engineer units could have used more equipment, could have used bigger equipment, but considering what they had available, I think they did a pretty damn good job accomplishing what they were sent to do.

Q: What was the reaction in the CBI theater in the summer of '44, when debate raged about shifting away from CBI?

A: I don't know. The support we were getting didn't really drop off too much because by that time the landings in Europe had taken place, and you couldn't have put any more equipment and supplies in Europe than you had without sinking the whole continent! I'll come to that later.



Walter K. Wilson, Jr. (r.) with his father in 1945 when both held the rank of general and were the only father-and-son general officers in the Army.

They had a tremendous amount of materials. Well, mentally there was a definite change, and it was kind of hard to take for some, and others thought we didn't belong here anyhow, let's go someplace else, but nobody really got away to amount to anything. Tom Farrell left in time to go back in '45 to get with the atomic bomb deal. He was theater engineer and Al Welling moved up to his desk.

Before I left India, I was commanding general of advance section, intermediate section, and base section. So I got a little bit of their background rubbed on me too. I couldn't find too many places that people weren't working as hard as they could to make things work.

Q: When did your promotion to brigadier general come?

A: Oh, that came in February of '45, if I remember correctly.

Q: So your feeling that the promotion would not come fast, though Wedemeyer said it would, proved true?

A: Well, that's true, and it didn't for other reasons. Stilwell didn't think much of Southeast Asia Command, and he didn't want to give anything to them. I believe my name was put in two or three times by Wheeler. That had to be approved by Stilwell in the American chain. This is where you were topsy-turvy. It was turned down, and finally I think Speck Wheeler got mad and decided to bypass theater headquarters and go direct[ly] to Marshall.⁶⁸ I was on a trip to London and Washington to try and line up our supply and equipment requirements for the year '45. I was in London in January of '45, and when I landed I had this big stack of requirements that had been drawn up by the staff, and I took it by the British headquarters to the engineer in chief in London and handed it to him and said, "It's going to take your boys at least two weeks to read this. I'm going to go see the war for two weeks." And he said, "That's a good idea."

So I went over to Paris and ran into a friend who gave me a command car and a driver again and a case of rations, and I took off to see the war. I

thoroughly enjoyed that. I got to see a lot, just a little bit after the Battle of the Bulge.⁶⁹ I got up to the 35th Division in the corner of Germany, just across from Belgium, where I got to see the division commander and staff and found out a little bit more about how my brother had been killed. I got to Antwerp, where I was buzz-bombed. I saw a little bit of the war, and I saw these tremendous stacks of supplies and equipment down all the autobahns, with the grass in between, stacked so high you couldn't see over the stacks. You just never saw so much. It was amazing to me. We hadn't had that.

I got back to London and walked into General Chorpening's office and he said, "You're out of uniform."⁷⁰ And I said, "Why? What's the matter with me? I think I'm in uniform. Have they changed it?" He said, "No, no. Just you." He took out a pair of stars and handed them to me and said, "We've been looking for you for ten days to promote you." I think what happened--and I checked this out a little bit--Speck Wheeler went direct, and Marshall came back and said, "Don't you ever do this again, but I'll go ahead and approve this one." And that's how it happened, bypassing Stilwell.

Stilwell had a real objection. I don't think it was personal, he didn't want to put any more rank in SEAC. I couldn't quarrel with it. The thing that really shocked me was the difference it made. I was halfway around the world by then and I flew on home, and, boy, when I landed on an airfield under military auspices as a b.g., I was a big shot, whereas two weeks before, the same guy had not been. It sure made a difference in the VIP treatment. I'd seen that on the British side, their Royal Air Force and the Royal Engineers. A British Engineer and I would go together on a trip and stop at a U.S. airfield, and we got pretty good treatment. But when we both stopped at a British airfield, as an American I got pretty good treatment, but the British officer was shunted off to the slums, which was hard for me to understand.

I don't know that I'm giving you any great answers to your questions. If I were running the war, I would never have set up anything quite like we had in India. I'll put it that way.

Q: What would you have done?

A: I don't know.

Q: Were there too many levels?

A: Too many levels. I don't think establishing the Southeast Asia Command did them any real harm. It kind of kept a bomb from exploding, but you did have a pretty tough situation because the people heading the government of India were quite experienced military people. They had been winning wars and fighting battles long before most of us had been born. And they couldn't get too excited about getting to China because they didn't think the Chinese were going to do anything anyway.

The whole problem was [that] our real mission in life was not one that you could really say, this is going to make or break the world. The further [sic] MacArthur advanced, the more obvious it became that no matter what we did, we weren't going to really tip the balance. Now, if we could occupy Japanese troops and keep them busy on the mainland, well that might have some effect. That's about the way it was getting about the time you're talking. And then Stilwell was getting in arguments. He got ousted out of there. Was it his fault or Chiang Kai-shek's?⁷¹ I don't know. I didn't see enough of that close hand. But I do know the attitude he had towards him. The Chinese were warlord oriented, and how could Joe overcome that? I think we botched things more towards the tail-end of the war and after the war as far as China goes. I don't know whether it was the fault--Stilwell wasn't around any more so I can't say it was his fault--but it's hard to work effectively in a place where everyone speaks different languages. The Chinese language is particularly hard to get along with. Now Stilwell had been trained for that though. He had been stationed in China. I'd known Stilwell, as I say, ever since Benning. I knew his daughter. It's hard to say how to do it. Second guessing is awful easy.

O: Stilwell wasn't too happy about the creation of the Southeast Asia Command at the Quebec Conference, was he?

A: Oh yes, but I think this was a device to keep peace in the family. The British felt that Stilwell was getting too demanding.

India itself was not a certainty, you know. There was a good deal of unrest. There was fear that if the Indians broke loose themselves, it could damage the war effort no end. And this could have been some part of the reason for establishing this command in India under Mountbatten. I don't know, but I suspect that had something to do with it. Well, I think I ought to get to the reverse, the going home part of it. I haven't covered that part of my life over there, which was really more demanding and challenging to me personally than the war part, due to my shift from a staff position in a multinational organization to a series of command positions in the U.S. forces.

On my first visit to Calcutta in January of '44, they were in the middle of a famine. I stayed in the nicest hotel in Calcutta, and the dining room was on the ground floor with big plate glass windows. You'd go in to have breakfast and there would be hundreds of people lying on the sidewalk starving. And there was a black market in rice, and their religion didn't let them eat the cattle, so cattle were stepping over them as they were lying there, literally dying. They brought around the wagon or cart every morning and picked up the dead ones and hauled them off. And I suggested that I take my food out and give it to them, but the response was: "Don't do that. You'll start a riot, and they will just be in worse shape. You'll make some of them die a little quicker, that's about all you'll accomplish." The political situation was pretty much touch and go. I'll come to it later, but there was another riot when I was commanding general of base section in Calcutta. I sat on the back porch of my lovely mansion watching them shoot at each other a block or two away. It wasn't too stable. There was a great fear, particularly on the part of the British, of India pulling out in the middle of the war and leaving a vacuum.

But as I said, I went to Europe and Washington to sell our list of equipment and material requirements.

Q. Were troops involved?

A: Not so much troops. By that time we knew we weren't going to get any more troops in Southeast Asia Command. Also some of the jobs were completed and others were nearing completion, freeing some units for additional missions and reducing requirements for additional troops.

Anyway, I presented our requirements in London through the engineer in chief in the war office of the British staff. I told him that while they were reviewing our statement of requirements, which would take at least two weeks, I was going to the continent and see something of the war in Europe and visit with various staffs and commands. So in the first week of February I flew to Paris and immediately got a break. One of the first friends I saw was Roy Lord, with whom I had served in the 3d Engineers.⁷² After listening to my tale, he arranged for me to borrow a command car and driver and a case of rations and be on my way.

I visited base section in Rheims and spent the firstnight with friends in Verdun. Then I headed north almost to Metz, and through the rear of the Third Army. I visited several of their installations just to the rear of the "bulge" country, where rain and thaw made mud king, and saw the effects on roads and troop movements. We drove through Luxembourg, Neufchateau, and Dinant to Namur, where I spent the night at advance section with two classmates from the USMA[<] Viney and Stubbs.⁷³ The next day they passed me on to Colonel Itschner (a future Chief), who had an extremely interesting job controlling road and bridge work and making use of the steel mills to roll out meter beams.⁷⁴

Then I drove to Spa, where Bill Carter was First Army Engineer. Be arranged for me to visit three Corps Engineers en route to Maastricht, and the headquarters of the 35th Division, where the division artillery commander and the assistant division commander told me details of the division's first day in combat in Normandy, where my brother, commanding a field artillery battalion, was killed.

The next day I drove to Antwerp, where I was shown around the port and depots--and dodged several V-1s and a V-2--and returned to Brussels.⁷⁵ The next day I went to Maas to visit some British units and spent the night in a farmhouse across the river from fairly active fighting just out of machine-gun range.

I had the chance to see nearly every type of military bridge, from floating to fixed, many still under construction by both British and U.S. Engineer units. Finally, on February 17th I returned to Brussels, sent my command car back to Paris, and waited my turn for a flight to London. When I reported back to the U.S. headquarters, I saw General Chorpening and told him of my visit on the Continent.

In a few days I had answered the questions raised by the British staff, had been authorized to carry their recommendations for approval to Washington, and headed for Prestwick, Scotland, for a flight home. I succeeded in borrowing a staff car to make the trip from London to Liverpool, which enabled me to visit Oxford, Stratford, and the Shakespeare country, and spend the night in an old Elizabethan inn. I finished the trip from Liverpool to Prestwick by night train.

Once again in Washington, I presented my statement of requirements to a military staff, this time the Joint Chiefs. Most people I contacted said, "That's pretty modest. We're proud of you for not coming with a request for more." But I couldn't find anybody that would put his name on it to approve it. The system in the Pentagon was you found somebody in the appropriate section to sign the list of requirements, and then you went around and got concurring initials from everybody involved, and then you had it done. So I was there about a month. My family came up from Birmingham, and I met my new daughter for the first time. I went every day to the Pentagon, walking around trying to get somebody who would sign it.

One day I was feeling pretty low, and as I passed by a friend's office-[Marshall S.] Pat Carter, a lieutenant general later also-he said, 'What are

you looking so low about?"⁷⁶ I said, "I'm just killing time here. I have this requirement list for our theater, I haven't found a single soul who says that it shouldn't be accomplished, it's logical, it's about the right scope. But until I get somebody to sign this damn letter I can't make any progress." He said, "Well that's a fair deal. You know I have nothing to do with this." I said, "I know, you're responsible for a different theater." He said, "Well, let me try something. Let me sign it." So he signed it, and in one day I had all the initials necessary for approval.

I then started trying to return to my theater. I suggested that as long as I was halfway around the world, I should return the other way. Everybody said, "Go through MacArthur's theater?" I said, "Yeah, one person isn't going to overload them." "Well," they said, "the Surgeon General just got run out of there two or three weeks ago, and MacArthur said no more staff visits." I said, "Would you mind at least sending a wire saying that Brigadier General Walter K. Wilson, Jr., returning to Ceylon, asks authority to travel through MacArthur's theater?" And they said, "You'll just get a 'no.'" I said, "Then you shouldn't mind sending it." So they sent it, and to their amazement the next day the answer came back, "Yes, I'd like to see him. I want him to stop and see me."

I knew that MacArthur and my father were friends, that Dad had commanded Corregidor until December 1940, so I felt the request would receive more consideration than a cursory turndown. I also felt the fact that the message mentioned that I'd traveled through Europe and seen some of the things there and was now in Washington and was returning to Ceylon might interest General MacArthur. At any rate, I received permission to fly that way, and I stopped in Hawaii and talked with General Richardson, who'd been commandant of cadets when I was a cadet.⁷⁷ He was the senior Army officer in the Navy theater, and I found out a little more about how things were being done in that area.

Then I flew on to Leyte, and reported to the chief of staff, General Sutherland, because MacArthur and the key staff people had just moved to Manila.⁷⁸

He said, 'Well, I'm glad to see you here; you can look around if you want to. You won't be able to see MacArthur because he's in Manila with a very limited staff and does not want visitors at this stage.' I said, "Would you mind sending him a notice just saying that I have reported and am available if he wants me, otherwise I'll just go on my way." Next morning they were looking for me all over. "Hey, he wants you now," they said. 'Get going!'

The story on Leyte was that there weren't any places to bed people down and so on, because they were getting ready for the main headquarters to move to Manila. But when I landed at the airport I was met by a Colonel Whatley, who had been a fellow CCC camp officer with me up in north Mississippi in 1933.⁷⁹ He was the headquarters commandant. He said, "Glad to have you." I said, "I'm going to leave right away." He said, "What do you want to hurry for? We have lots of room." I said, "I don't want to interfere." He said, "I'm already making rooms available for the staff when they come, and you can stay as long as you want." so I had a very lovely room with some shell holes through it, but it was very nice.

And I reported to MacArthur for what I expected to be a courtesy call. Shoot! He sat me down and pumped me for everything I was worth. I'd come up through Italy; I'd come through Cairo, England; I'd been over in Paris; I'd been up into Belgium; I'd been into Holland and the corner of Germany; I'd seen all these things; and he just pumped me. He asked me the same questions you have to some extent, but he wanted to know what about the supply situation, and I gave him the same answer that if they had any more it would sink the damn continent. He said, "That's exactly what I expected, that's what I wanted to find out, because that will give me a stronger attack." He kept going like that, and after about an hour I said, "General, I had better leave or your staff will want to scalp me." He said, "No, no, you've given me what I want, now you haven't had a chance to ask me any questions." So I started asking him questions. He explained what they were up to, how they were getting along, and what their plan was for invading Japan. It was a glorious opportunity

for me. And I finally said, "General, I think I'd better go." He said, "That's fine, I'll let you go now. Where do you want to go?" "Well," I said, "my old 3d Engineer Company is just a little bit north in the mountains. I'd appreciate the chance to go see them." He said, "It's all arranged; just tell my staff where you're going.'

So I was flown to Sixth Army headquarters, where I visited General Sam Sturgis, Sixth Army Engineer (and a future Chief of Engineers).⁸⁰ I briefly saw several classmates and lots of friends in that headquarters before driving up into the mountains to visit my old C Company, 3d Engineers, although there was hardly anybody left in it that I had known. I stood there in the mountains looking across the valley and asked, "The Japs are in those caves?" And finally somebody said, "Would you mind leaving now? You've stood here long enough. You will attract some fire. And we don't want to get hit." So I left, and sure enough some artillery shells came in there just about two or three minutes after we moved down the trail. En route to Manila by air we overflew Corregidor, where my father had commanded just prior to World War II, and I could see where my parents had lived, and the results of the war. Then I continued my journey by way of Australia into Ceylon. So I made it all around the world on this occasion.

After I returned to SEAC in Ceylon they said, "There's no need for you to return to the rear echelon, you can stay down here in Ceylon now," which was a nice change. I had about three or four months there. It was kind of a pleasant backwater, if you know what I mean. Suddenly the war ended.

In the meantime, Lew Pick during the summer had left advance section for R and R at home, and Paul Yount had been moved in there to take command. And when Lew Pick returned to the theater there were some problems. Apparently the theater commander had decided he'd keep Yount in command and send Lew Pick home. It was a pretty rough situation. Paul Yount had had a real tough time. Paul had been overseas longer than anybody. He'd started on the rail support line to Russia, and then moved over to India. So now, with the war ended, he was being sent home. And I was told I was the replacement as

commanding general, advance section, India-Burma theater. I was the newest BG in the theater: hadn't had too tough a time, so I could foresee that I was going to be the guy that closed out the theater before we finished with it. I went up to Ledo immediately.

I was told one night to leave the next afternoon, and by the next morning I received an invitation to a luncheon in my honor by Mountbatten, which he didn't have to do, but I thought it was very nice. And I asked Lord Louis if I could go to the surrender ceremony. I said, "I've been with you now for a couple of years, and I'd sure like to see the finish." He said, "If you can escape from the U.S. forces up there, you get back down here and I'll let you ride in our seaplane down there to see it." And General Wheeler was going and some others. So I went to Ledo and took command, got things fairly well lined up as far as I was concerned, and then flew back down to Ceylon, and went over and watched the surrender at Singapore. Extremely interesting. And I felt I had earned that much by staying in SEAC that long. But that flying boat ride was something: I came back to Ceylon the same way and then returned to Ledo.

Advance section in Ledo is the place where the U.S. effort had been largely centered until you got into China, and the advance section folks thought they'd won the war, which was pretty accurate as far as our area was concerned. Then here comes this fly-by-night-- they were all Pick admirers, and Pick had left--and Yount had moved in and out, and here I am! I had learned to know quite a few of them in my travels, though, and hadn't made any of them particularly mad. I'd given them some help. so I sized it up that from now on the biggest effort was going to be closing out and going home, and that those who had really done the greatest towards winning and making the prior progress would look on this as child's play.

It looked to me like my best solution was to send home all the big shots and find some little shots who could be challenged by this operation. so I called in the top staff, who were already individually seeking appointments to ask me when they could leave, and told them all at one time,

"You go and bring back a recommendation with the name of a man who can do the job as well as you've been doing it and who hasn't been here as long as you have, and I'll appoint him immediately and you can go home." By the next morning I'd lost nearly everyone but my chief of staff, who was a regular officer, and he was staying. The other key people were practically all gone. And to this day I meet with them once a year, most of them, the Ledo Road crowd-well, they meet once a year and I join them. They are some of our best friends.

But they hadn't been gone more than several days before I realized that I had been somewhat suckered. They had recommended their number two guys, and these men had been over there within a few months as long as the originals, and they were just as impressed with what they had accomplished. So I called them in and said, "Okay, now I want you to go out in the boonies and you pick out some people who haven't been here more than a year, people who can do the job you're doing, and bring them in, let me meet them. If you've got a good one. I'll let you go. If you don't have a good one you're going to stay here until hell freezes over." They got good ones!

And within another three or four days I had a complete new staff. So in the month of September, advance section was served by three different staffs in turn. But it was the best thing I could have done, because they were young, enthusiastic: they weren't impressed too much by what they had accomplished before, but they were impressed with the problems facing them. And there were problems:

At that stage in life I commanded about 50,000 Army troops and quite a bit of civilian labor, and Gurkhas; altogether about 70,000 or 80,000 people.⁸¹ And my main job was to get most of those American ones home in the next three or four or five months. So we worked on it pretty hard. I came to the conclusion that I would spread the word that people were going to go home in the order that they should go, irrespective of job, and we weren't going to let a lot of them sneak out with an outfit just because the outfit had been there a long time. But if they were replacements they were going to get pulled out, and vice versa; the

old-timers in other outfits that were staying would get pulled out and sent home.

So I cranked up a flight to Kunming, and we got a jeep and a panel truck and drove back the 1,076 miles stopping at every outfit and telling them about when they'd be able to go home in general terms, the sequence and the order so that they could see we weren't cheating. And we stopped at every little pumping station on the pipeline. It was something. Those little pumping stations would have about three people there, and they'd taken the washbasins and other conveniences from downed aircraft, and they had themselves fixed up very nicely.

But it took about a week to ride back from Kunming. The party consisted of me, my chief of staff, Colonel [Richard] Dick Selee; my aide, Captain [James E.] Jim McNamara; Major Gerand; and two drivers. And we made it! Dick Selee didn't think he should go because he was chief of staff of advance section and both of us should not be away from the headquarters at the same time. I said, "You'd better go now, or you'll never make it." On the way home he received a message from our headquarters saying he was being transferred to Panama, which is where he wanted his next assignment since his wife was from Panama. So he was glad he had gone on the trip. And the trip was a success. We saw a lot, we explained a lot, and we really never had any incipient riots or disciplinary problems in the closing out of advance section, I think to a large extent as a result of our trip and telling the facts.

We were bringing about 5,000 men a week into the staging area and getting them cleaned up and serviced up a little bit, and loading them and sending them off. About that time I got back to Ledo and received a phone call from Al Welling. He said, "Do you know who the new theater commander is now that Speck Wheeler is gone?" I didn't know so he told me it was Tom Terry and asked if I remembered him from cadet days.⁸² I did, and I wondered if this was his first trip overseas. Welling said, "This is the first time he's gotten in the war, and yours is the first outfit he's going to visit." I asked why he was telling me

this, and he said, "I want you to know that I have done my best for you. Yours is the first one. Now he thinks the war can be run by people who have spit and polish like we did as cadets when he was a tactical officer. That's what you are facing."

I thought I knew what he'd think and what he'd look for when he came. How in the world could I correct it? Those guys hadn't had a shirt on in a couple of years. It was a pretty hardworking but unmilitary-looking crowd. I called in my aide and told him to take a jeep and get it painted shiny, put oversize tires on it, paint the tires white, get a big star and put it on the front, and just make the whole jeep look obnoxious. I wanted it the next morning. So he showed up with it. It was really obnoxious. I got in alone and started riding around. Every time I'd see a soldier walking down the side of a road with his shirt tail flapping or with no shirt on, I'd pull up alongside him and say, "I'm General Wilson, the new commander here. I thought I'd give you a little friendly advice. We're sending a lot of people home, but we have made a new rule. If you want to dress and act like the Indians, you can stay here with the Indians." He would start putting his shirt tail in, and I would say, "That's right. I just thought you might appreciate knowing." He said, "I do." I said, "You do what?" He said, "Appreciate knowing." "Knowing what?" "Oh," he said, "sir, I appreciate knowing." And I said, "Fine." I said, "Will you just spread the word?" He said, "Oh, yes, sir." He started off and I said, "Wait a minute, didn't you forget something?" "No, sir," he said, and then, "oh, yeah," and he gave me the first salute he had put out in some time. Well, I did that all around the Ledo area for three days. I'm sure it started a lot of rumors about the screwball they had up at headquarters, but I thought that was better than trying to get on the radio and pleading with them to buck up.

I drove to the boundary of advance and intermediate sections and met General Terry and put him in the car, and we started back up the road. And I'm a son of a gun, we hadn't gone more than about four or five miles when off on a side road, way off in the distance, suddenly some men jumped to their feet and saluted. And I saluted back, and Terry

looked kind of surprised, and we went on. He was there for three days, and when he left he said, "Wilson, I want you to know that you have the most military organization I've ever seen!" It worked.

Well, it was quite a job bringing them in and so on. We were also trying to consolidate all the supplies and equipment in various places in order to dispose of them properly. We had one unit known as "Little Peoria." It was an Engineer maintenance outfit that had been recruited in Peoria, Illinois, where the Caterpillar tractor factory is, and they were a good outfit. They knew how to do the maintenance work. If people could get their equipment to them, they were real happy. But it was time for them to go home, and so they had come in and they were in the staging camp, and my IG [inspector general] came to see me. He said, "Sir, I'm sorry to tell you, but I've heard a rumor that 'Little Peoria' dumped a lot of parts out there in the jungle where they were." I asked if he had looked and he said, "No, I haven't looked yet because I don't want to have to skin them. But I'll go down there if you'd like." I told him I'd talk to the commander, so I brought him in and said, "I'm sorry to tell you this. You've had the finest outfit over here as far as maintenance goes, but I understand that in order to make it easier and get out of Burma on time and get away from here, you may have done some things that you're not particularly proud of." He looked kind of startled, and I said, "Yes, I'm hearing a lot of things. I've got several choices. I can send the whole company back down there to clean the area up and bring everything in, which will delay your return to the States by several months. Or I can send on the bulk of the enlisted personnel and just keep some of you officers, let you do it and take many more months. Or if you want to handpick a crew to go down there, your outfit's due to get on the train next week. We'll put them on the train and we'll fly you over to Bombay to join them if you've really done the job right." "Oh, yes, sir," he said, "let's try that one." So we did, and they brought in one helluva lot of parts and things. But that kind of thing was going on all the time. We had to keep watching it.

The Foreign Liquidation Commission [FLC] had the mission of selling surpluses, except in India where surpluses were to be turned over to the government of India under reverse lend-lease. We had certain things we assembled in Myitkyina and certain things we brought back in to Ledo, and we were getting word that they were having a lot of thievery going on in Myitkyina. So I asked who had been providing security in the past, and they said, "We used to have a pretty strong Gurkha outfit as guards down there." So I said, "Let's get them." So we recruited the Gurkhas, and I went back to Myitkyina, and we installed them. I went back a week later and said, "How are we coming?" They said fine. They weren't having anything stolen. I said, "Nobody's even tried to steal?" "Oh, yes, sir, they have tried to steal." When I asked where they were, they said, "They're in the river." They had cut their throats and put them in the river! It discouraged the thievery no end: The culprits were largely Chinese deserters roaming north Burma.

We collected a mass of materials and equipment. We also had a great big Engineer depot in Ledo that was being filled up. One day a man came in and said, "Your explosives area, your TNT area, is in trouble. It's been stacked out there for several years, and nobody has enforced a first-in/first-out rule, so you have some piles of stuff that have been there for two or three years, and nitroglycerin is dripping out of them. Trucks have backed into a corner of stacks, so you have boxes hanging over. Any minute something can go. They're trying to clear the stuff now, but a truck driven by a Wog hit a bump and he and the truck, and the load and all, went up and almost took out a village up on the side of the hill.'

I went out there to see, and it was pretty sad looking. It was all he had said, and you could see the stain of the nitroglycerin. I was scared to walk around it. We asked for help through I-B theater, and we were sent some experts from Australia who worked pretty hard to devise means of disposing of the stuff. The Wogs who were loading it were carrying it on their heads to put it on the truck, and the nitroglycerin was seeping down and giving them terrific headaches. We had theater support, we had everybody helping. We finally very

carefully transferred it to a certain place where we figured that when a blast went off, it would jump over a village in the valley.. We evacuated the village, though, just to be safe, and got it there and finally exploded it. It worked just exactly like a charm. We had built a little dike to keep it from going down into the valley, and the dike disappeared but it stopped the explosion. It did jump over the village so the people went back and found no damage.

The Foreign Liquidation Commission wasn't making much progress, and I could see us sitting there forever, just guarding the surplus. So I asked permission of the FLC to let me sell the surplus in Burma, at Myitkyina. They said all right; if I thought I could, I should go ahead. So we put out the news, and the first thing you know a great big tall, six foot-one-or-two-inch Pakistani showed up--it was Indian then, but he was from the Karachi area--and said he wanted to buy everything we had in Myitkyina. I asked if he knew how much we had there, and he said he did; he had seen it. I asked how much he was going to pay us for it, and he told me a number in the millions of dollars. I asked if he had the money in the bank, and he said he did. He told me the name of a bank in New Delhi. I told him I was going to check it. He said, "Yes, sir, by tomorrow morning the money will be there."

Well, I checked that afternoon but there wasn't any money there. The next morning they called up to say the money was there. So we continued our negotiations with him. One of the things he demanded, though, was that he get my car, which was in India. We couldn't sell anything in India, so I said, "That's one you can't have." He said, "I've got to have it -or I'm not going to carry through this deal." So I told him I'd let him go down through the cars, and he could pick any three of them, except mine, and the ones he picked we would overhaul and put in fine shape and drive to the Burma border, which is about 45 miles out of Ledo, on the day in question. When he finally signed the contract we would deliver him the cars and keys right there. He said that was satisfactory, so that was the basis on which we sold one helluva lot of stuff. It was getting pretty dangerous in Burma. There were lots of Chinese deserters and

just roving people. How he got it all out of there and converted it to cash, I don't know, but I understand he made a go of it. And the railroad wasn't working in Burma, which must have added to his problem.

The pipeline east of Myitkyina would obviously be a problem to dispose of since it was built of lightweight invasion-type pipe which probably wouldn't hold up for over four or five years and hence was probably uneconomical to salvage. Realizing that the China theater was planning to cut away from India-Burma theater in November and instead open up their line of communications to the east-and realizing that advance section would be stuck with the security of the lines until they were disposed of-I requested that the theater and the FLC initiate action to abandon the pipelines east of Myitkyina. But I was turned down.

About a week before China theater was to evacuate Kunming and cut off the telephone to Ledo, I received a call from Colonel Bill Creasy, who had served in Schofield Barracks when I did and was the umpire for the officiating team that I headed as referee in the soldier football league.⁸³ He asked if I knew they were moving out in a week and, when I said yes, asked what I was going to do with the men at the pipeline stations since with their departure these men would be in danger from bandits and Chinese deserters. We discussed the problem, and I asked if he would call me the day before the telephone line was to be cut and tell me he had just been shot at and that I was risking people's lives by leaving them guarding the line. He said he would, and a week later, true to his word, he called mad and said, "Weary, I've just been shot at. And I don't mean maybe, I really was shot at." I thanked him and called New Delhi, reported this conversation, and asked permission to call these men in before we lost any lives. I asked that the theater commander be informed of the situation, the call from Creasy, and my repeated recommendation to bring in the men. If I didn't have specific orders in writing by the next morning to leave the men in place in spite of their danger, I would order them in to Ledo. I reminded them that tomorrow morning would be the last time the telephone line would be in service beyond Myitkyina.

Not having had any response by 4 PM, I directed the pipeline command to telephone each pumping station immediately and direct them to leave for Ledo. The operation was a success. No one was hurt, but it is of interest to note that no message, reference the problem, was ever received from higher authority.

Next I began thinking that Joe Cranston, commanding general of intermediate section, would probably want to go home pretty soon from Chabua, which was just a little bit down the road, about 80 or 90 miles, and probably I would end up consolidating advance and intermediate sections. Sure enough, the word came. Joe Cranston had to go home for health reasons, and I would consolidate the two. So I did in early November. I learned a lot from this consolidation. For one thing, I had carefully avoided taking any favorites with me to put in the consolidated staff; but I went to Chabua and told them to show me where they were going to have requirements after they had sent home those present staff members who were due to go. I would bring with me from Ledo just those necessary to fill those slots. And we did that, and it worked just fine. We didn't have any real friction consolidating. And on the 15th of January, I used the same principles in consolidating all three sections into one with headquarters in Calcutta, making me commanding general of base section, India-Burma theater, or in essence, the commander of all ground force units remaining in India and Burma.

In Calcutta I found out that my predecessor, Bob Neyland, had contracted for a beautiful home, complete with many servants, as his quarters, and the contract could not be terminated until May. So my aide and I, together with five or six of my staff, moved into this house which had housed Bob Neyland and his aide. The house and servants belonged to the estate of a steamship line president; was two-story with about six bedrooms, a grass tennis court, and orchids growing in the garden.

By this time in my progression through India, I had concluded that we would do ourselves, the Army, and the U.S. taxpayers a major favor if we could clean up our records, inventory all our depots, turn over

our surpluses and clear India by June 1946, hopefully before investigators finished their more lucrative targets in the Philippines and Japan and reached our little backwater. Clinching this analysis were calculations I had made which showed roughly that--based on the average U.S. population expected in India between January and June, together with costs of local labor, rentals, etc. --it would cost several hundred thousand dollars to the U.S. taxpayers for each day we stayed in India. Using these rough figures, I directed that our various negotiators use this several hundred thousand dollars as a unit of measure in reaching prompt decisions on those activities which would ultimately determine when we could close the theater. This discouraged days of quibbling over minor sums that risked adding several days to the date we would close the theater.

Calcutta was not all pleasant. Again there were hunger and political riots. We had a good provo [provost] marshal in Calcutta, and he had a system where his patrols would go out the first thing in the morning and decide where the safe and unsafe areas were. They would come back and get on the radio and direct our troops how to get to their jobs. We didn't have any losses although we almost lost a couple of his MPs in jeeps when they got a little too close to the rioters. We had a lot of troops being loaded on ships from a staging camp out in the boonies, not too far, but I directed them to put their bows and canvases on the trucks because they went under several underpasses. I told them somebody would drop some paving blocks down on them. One guy knew better than I did, and he sent one convoy off without the covering, and sure enough somebody dropped a big rock down and cut open one of my men's heads. But we patched him up and got him on the same ship. Thereafter they put the darn things on. That was another problem.

A third one, we were getting ready to turn over the supplies in Ledo to the British Army in India. Ex-advance section was now down to a corporal's guard really. I got a call from Colonel John A. Morris, who was left up there as the last king of the Ledo area and he said he had some bad news for me. I said, "What's that?" "**Well,**" he said, "you know we're supposed to be turning these surpluses

over to the British; and we have made inventories, and they don't believe them. so they came over today prepared to start. They brought one subaltern and about ten other ranks. They are each equipped with a footrule, and they are starting on the reenforcing steel, and with a footrule they are going to check out the inventory of reenforcing rods you couldn't see the end of! Now that's just a sample. From there they are going to other things in the same style."

So I flew up there and got with them, and they got their bosses there and said, "Well, we can't trust this inventory. It's not good enough." So I asked what would they trust, and they said, "We're going to do it ourselves." I said, "Now wait a minute now. Suppose I send experts up here, and we make a combined team. You have somebody with every team, and if we can make an inventory that way, will that be satisfactory to you?" And he said, "Well, I'll have to ask my general." So he went off and got word back from his general that that would be all right.

So that's what we had to do. I had to scour the theater for anybody that knew supply procedures, nomenclatures and the like. There weren't many Engineer ones, but there were enough of them that knew something. As a matter of fact, at the time I was up there checking the inventory, we went to an item marked "Sets, Instruments, Drawing, Incomplete." There were supposed to be about one hundred of them, and I said, "What do you mean by 'sets, instruments, drawing, incomplete?'" I was told that was easy; there were probably one or two things missing in the set. So I said, "Okay, let's go look." And we opened up a hundred of them, and there wasn't a single one that had a single instrument inside the box! And that's when I realized that we had to redo the inventory. So, in a month of high-powered effort, sending back about two or three hundred people, and working like dogs, we produced an inventory that the British were willing to take. And about the middle of April we closed out Ledo. Then we did the same thing in Chabua.

Incidentally, I had been continuously getting letters from the Secretary of War's office in the

War Department saying, "your rank will be returned to colonel on such and such a date. You're entitled to be home two weeks before that.' And each time one of these would come I'd call the theater commander and say that I was due to leave now, the first of February or whatever. And he'd say I couldn't do that. "Well," I said, "here's what's happened." "Okay, you just keep on staying and I'll get that changed." So he kept getting it changed. But finally, with a revised deadline of 15 May, and we were within 30 days of closing the theater, I said, "I don't want to stay any longer. I'm not going to push it, but I do want to be home for two weeks with this exalted rank, I'll never see it again." So on the first of May in 1946 I flew home and was returned to colonel on the 15th or something like that, and then I went up to the St. Paul District as colonel, District Engineer.

One more thing before we move on. I thought coming back now with Speck Wheeler as Chief of Engineers, boy I had it made! I could get myself a nice job. so I reported in to General Wheeler, and he welcomed me home. I asked where I was going, and he said, 'I've got some ideas for you. Can you come in tomorrow morning with what you'd like, and we'll see.' That was fine with me, so I showed up the next morning, and he had his personnel chief there; they had big books. He said, "All right, now to start with I'm going to tell you what I really want you to do. I've got a very key job that we've just established in the Pentagon that you're ideal to fill, and it would be a real help if you can take that job." And he gave me a buildup for about 15 minutes. And I finally asked if I could say what I really thought, and he told me to go ahead. "Well," I said, "sir, I haven't been in a District for 16 years. It looks to me like if I don't get a District Engineer job now I'll never get one, and I feel like I'm getting short changed, because I think it's part of my career, and I ought to have a chance at it.' He said, 'I was afraid you'd say that. All right, I'll see what we can do for you now. What District would you like to have?"

Well of course I'd called home that night before and talked with my bride and asked where we wanted to go. She said Mobile; and I said fine.

Jacksonville, fine. Savannah, fine. New Orleans, fine. So I stood in front of the desk, and he asked where I wanted to go, and I said, "I'd like to go to Mobile." But somebody had just gone to Mobile: somebody else had just gone to Jacksonville. I said, "General, would you mind telling me where there are vacancies?" So they turned the pages, turned the pages, and turned them back again. Finally they said, "The St. Paul District," and I said, "I want to go to the St. Paul District."

The Chief said, "That's a wise choice. It's the only one you can get. It's an old-line District: they've got a lot of experience there, and if you go there for six months and keep your mouth shut you'll get to be a good District Engineer." I thanked him and told him I would take his advice. And that's how I went to the St. Paul District. But having lived three years in the environs of India and Ceylon, I went to a completely opposite climate.

After a short vacation, once again in Clearwater, the whole family took off for St. Paul by car. I reported about mid-June, if I remember rightly. I think it was a wise choice by General Wheeler. I don't know whether there were any other Districts open or not, but he did take cognizance of the fact that I had been absent from civil works a long time, and he put me in a District that was not under a pressure cooker at the time, and with very experienced, able personnel. St. Paul District had been a very busy District, particularly in the thirties, during the channelization of the upper Mississippi. The personnel were very stable. I very wisely learned a great deal from them, which I was later able to use when I moved from St. Paul to the Mobile District.

The District's workload in St. Paul was relatively small. There were quite a few small flood control projects, major drainage, small reservoirs; primarily for flood control and to some extent for water supply. There was a lot of work on the operation and maintenance of navigation on the upper Mississippi. And there was additional work going on, contracts, on locks and the extension of navigation up into the city of Minneapolis. There

also was quite a problem in public relations, in that the navigation system had been operating long enough that the people in Wisconsin and Minnesota had more or less forgotten the extent to which they benefited from the navigation project, and in turn had gotten around to the fish and wildlife side of life: that nothing must be done to interfere with the growth and development of the fish or birds.

We had considerable work in this field. With the advice of some of my staff I got pretty smart for a change and hired as the public relations man, the technical liaison officer for the St. Paul District, a relatively young man who had come from the U.S. Fish and Wildlife Service. Mr. Warren Nord was well trained in that field and had experience for quite a few years, and a nice personality. And we put him in and told him his job was to tell them the truth throughout the area, find out what they really felt like and wanted, but primarily, in addition to that, to see to it that they got a real understanding of what was involved.

The usual taking of real estate for a reservoir is based on pivoting from the dam, which tends to create a major taking in the upper ends of the reservoir in order to provide flowage for the high waters to not encroach on someone else's land. In the St. Paul District there had been a determination made in the early days of navigation improvement to pivot them about the midpoint of the lake, which cut more than in half the taking in the upper half of the reservoir. But in turn that meant that in times of high water you actually had low water at the dam itself, which sometimes required additional dredging. This also affected the backwater channels throughout the reservoir. And many of the hunters and fishermen felt that the St. Paul District and its operation was doing its best to disrupt the natural regimen of the river. We made a little model, a moving model, and the public relations man went up and down the river explaining it to any groups that would listen--Rotary Club, Kiwanis, Chamber of Commerce.

Q: Were there any organized environmental groups that were specifically involved?

A: Oh yes, the fish and wildlife associations were there. This was a very sports-minded area. And as

a matter of fact if you went back to the early days and looked into the history you found conditions at the time I'm talking about so much better than they had been that it's remarkable. But people just don't remember that. They can remember where grandfather used to take them fishing when they were a little boy, and it's no longer accessible, or something of that kind, or it gets flooded. But anyhow, most of the three years that I was in St. Paul we were fighting that battle, but we did make progress. And this use of the man who knew more about wildlife than the rest of us, including most of the critics, was beneficial to us.

On the reservoirs, our area of responsibility touched the Missouri on the west, where water and flood control and power were very important features. We operated in the eastern half or better of North Dakota, and I got a lesson from a project in this area. The state of North Dakota had a water board [the North Dakota Water Commissioners], in essence headed by the governor, and they met about every three or four months to keep up with the progress. They more or less ran herd on the Corps of Engineers and the Bureau of Reclamation in this field. And they also deliberately set their own projects in priority and got the whole state to agree that project so-and-so was number one, whereupon they spoke with one voice in Washington, on the Hill, and in the administration. And they were very effective.

The first time as District Engineer I went out to Bismarck to attend one of these meetings and make my presentation, I thought I knew a lot about my District. I had been there about two months. And after I sat through that meeting I realized that the governor of North Dakota knew about three times as much about my projects as I did, and that was the last time he knew three times as much about my projects: They weren't trying to ride me on the thing, they just knew more. That wasn't the way it had to be. I had to know as much about it as they did.

We had one project in Valley City, North Dakota--Baldhill Dam--which had an effect on the Missouri River work in that it was in the same state and it could compensate to some extent for

some of the things that were to be done there.⁸⁴ And it would be affected by the Missouri-Souris project if it ever was completed.⁸⁵ As usual, people living in the reservoir bottom resisted the taking of their land, for which I didn't blame them, but I had a hard time there in public relations.

Once again, it was before Mr. Nord. I was invited out for a Fourth of July address to the little city of Arlee, North Dakota. It's just a little town. I arrived there in early afternoon, and I didn't find a soul in the place. Finally a man came up from a basement level and said, "Are you Colonel Wilson?" I said yes, and he told me to come down. I went down, and he said, "I'm the man that got you invited out to make this talk. Whatever talk you brought, forget it, because what we want to know is why do you have to take the farmland."

Well, I had a patriotic speech in my pocket, which I put away. He told me that the whole town was out at the edge of town at a fair, that they would come in about six-thirty or seven, and when they filled the hall we would start. That was some night: When I started talking, it was like talking to a bunch of cold-eyed fish. I started off by quickly saying, "I know what you want. I know why you don't like what we are going to do. I want you to be sure you realize that this has been analyzed and authorized by the Congress and appropriated for by Congress. And they tell us what to do, and we've been told to do this, so we're going to do it. Now, from now on let me tell you the things we could do to make it easier for you, to make it possible for you to get your money out promptly, and to get relocated and so on." That pretty well broke the opposition, but it was a rough night.

And incidentally, I was sent back from my next assignment at the time of the dedication of the Baldhill reservoir, and I found to my pleasure that prior to the dedication, prior to completion of the total project, that there had been a flood, that the project had operated beautifully, that it had saved damages to Valley City downstream of the dam far more than had been spent on the entire project to that time. So that made me feel pretty good. The other projects were small, small dams, but it was something to learn on and get experience with.

Q. What accounted for the District's involvement in Alaska?

A: There was a very interesting responsibility in the St. Paul District when I joined it, which would be different than almost any other District might have. and I believe it's worth discussing a little bit. It was basically tied to the matter of permafrost, the permanently frozen ground which lies under about one-fifth of the earth's surface and is prevalent in Alaska and particularly in Siberia. In construction for World War II in Alaska, the Corps of Engineers, the Army, and the Air Force had run into it and realized they didn't know enough. So they started some research on it and had apparently assigned this research subsequently as a continuing project to St. Paul District.⁸⁶ Before the war ended, as they began phasing out, I think, they passed it on to the St. Paul District, because when I got there we had a research area in Alaska near Ladd Field at Fairbanks. We had a fine young man named Barney Trawicky as resident engineer, and a couple of assistants.

We had a section in the District Office in St. Paul which was doing library research and supervising the work being done up in Alaska and also supervising a contract with Purdue University on using air photography to interpret the location or extent of permafrost. It was something that needed to be done, no question, because, for instance, in the Fairbanks area at Ladd Field you were pretty close to the southern limit of permafrost. It was in an almost balanced area. The permafrost was heavy to the north of it and spotty to the south. If you scraped the natural insulation and the vegetation off over the permafrost, it could thaw down very quickly and only have maybe 15 or 20 feet to go and drop out, whereas further [sic] north you'd get a thaw right there where you took off the insulation, but it wouldn't go through the permafrost. There were a lot of lessons to be learned. How to live with it, how to build through it, how to build new roads without having the bulldozers disappear down out of sight the next day when you came back to them.

Q: Was there thought of having to work under these conditions in a future conflict?

A: There was a thought of having to do it in a future conflict or in trying to build up Alaska as a protected area, and there was also a thought of having to do it if we got into a fracas with some other country and got over into their bailiwick. The reason why we particularly had the contract was to try and find out more about using air photos to interpret.

Now during World War II there had been quite a program in the South Pacific to determine what the geological conditions were by means of air photography that showed what kind of vegetation growths there were, and this would indicate something. Well, they found out that with permafrost they could do the same thing in general. It would enable you to select areas to go and try and get a new airfield built and to select other areas that under no circumstance you would get near them because you were sure to have trouble. It wouldn't pinpoint the exact extent of the area, but you could pretty well depend that if you picked the ones that looked best on the aerial photographs and landed and went there, that you would have a good start in those areas as opposed to the others. Basically the intent of the whole program was to retain and refine the lessons learned, or those which should have been learned, in World War II, so that they could guide future work in northern climes and also to develop methods of selecting by air these areas which were the ones to go and explore first.

Then on the Purdue. [University] contract, Professor [Bernard] Woods was the main man, and a young man named Bob Frost was also working with him as a graduate student. He later became a Ph.D. They were spearheading this contract. In the District it was managed by a separate Division headed by [Major] Henry J. Manger, a civilian employee, who on active duty had been District Engineer of St. Paul in World War II. In OCE, as I remember it, the guidance came from a research branch in military construction. I remember the names of Tom Pringle and Bob Philippe. It was a successful program, and I think it should be mentioned here.

Similarly the main effort of the permafrost research was being carried out in the same elements in OCE and St. Paul. In Fairbanks, just outside of Ladd, as I said, we had this small research area. In order to attract and keep good men we combined research and practicality by constructing three residences in the research area, each with a different type of foundation. And our three key people lived in the houses that were erected on top of these foundations. At Northway, a World War II airfield, for several years, even though the field was closed, we continued to heat a fair-sized hangar all winter and kept track of the continuing drop in the permafrost level underneath it and the extent to which the sun had an effect. The south side was going way down, and on the north side it was a lesser thaw. This program also paid later dividends in some of the lessons. Several of the people, Trawicky, Frost, and so on, were helpful in the Thule work in the midfifties, as well as in northern Canada.⁸⁷

Incidentally, the St. Paul District, Manger, me, and one other, and representatives of OCE participated, about 1948 in England, in a so-called world conference on permafrost. We were some of the experts present. Also, before I left the St. Paul District in June of 1949, I initiated, at the request of OCE, a program of research on snow by seeking contracts with the University of Michigan, the University of Nevada, and Stanford University. Now this was basic research. I mean, what is a snowflake and so on, to get going into a broader discussion and research on this material. After I left, Henry Manger and his division were moved [Wilmette, IL]. Then the New England Division laboratories (pursuing a fairly extensive program under OCE guidance in ice, frost, and so on) and the permafrost and snow programs got closer and closer and ultimately became the snow, ice, and permafrost organization. BY now I think it continues, and I sure hope it preserves the tricks of the trade, as the U.S. Army Cold Region Research and Engineering Laboratory in Hanover, New Hampshire.⁸⁸

The last spring that I was in St. Paul, Barney Trawicky called me and wanted to know if I'd give him permission to visit the St. Paul District

office. He wanted to fly down and pick up a car and drive it back up to Alaska. I said, "Okay, I'll be glad to authorize that because we have some need to get you here and discuss some of the programs, provided you'll give me a ride back to Alaska." And it turned out that we organized a little convoy, including some of the Alaska men who ran the Alaska Highway Department. We had a panel truck and two cars, about six of us, who drove back up there, and it was extremely interesting. I was amazed. It reminded me an awful lot of the Ledo Road. but under different circumstances. It was paved by a substance we never had use of in Burma. We deliberately made the trip before the spring thaw so that we had snow-covered road, which was real nice and good driving. We spent the nights in the former construction camps that had been converted to hostels. It was extremely interesting. Okay, what else do you want to know about St. Paul?

Q: What about flood problems in the District? Weren't they usually a result of melting snows?

A: Oh yes, we had the usual ones. The problem in the St Paul District is that the Red River of the North runs north, and nothing else in this country runs north. So when it thaws, it doesn't thaw downstream, it thaws upstream. So your water comes flowing down, and it's blocked by the ice and it spreads out, and the Red River of the North could get to be 10 or 15 miles wide. It's a Canadian problem as well as a U.S. problem. The Red River goes up past Winnipeg. There were a good deal of international relationships required in trying to work it out and work together, and we organized ourselves pretty well, to be sure we flashed the news and the warning to them as fast as it developed. Incidentally, shortly after I retired, years later, I got asked to come back up there as a consultant to the province of Manitoba in getting prepared to fight a flood which was going to be a big one, and it was very interesting.

Q: It was one that they knew about ahead of time. It must have been a rush job, though.

A: Well, yes. You raised little levees about three or four feet high and that could be enough because it

spread so far. But where was it going to happen and how high was safe? I went up there and spent three or four days with some people from the St. Paul District and me as a consultant and the people in the province who were going to fight it. It was a good exercise, and I think it did its job.

One thing, again, remember that I suggested earlier that you have intellectual curiosity. Well, recreation was becoming a growing thing in our work as far as I could see. I decided my last winter, when activity was somewhat reduced--and boy they can have snow up in that country--that I ought to find out more about recreation and what was being done to plan for it. So I got permission from my Division Engineer and the Chief's office to go visit the Division and District people who were out in Little Rock and Tulsa and visit their projects. They were in a big program with reservoirs and so on. also a tremendous amount of recreation development in the Ozarks and some other areas. I took two people with me, one from the engineering division and one from the operations branch, and we went down there for about two weeks.

We drove around and visited the different reservoirs, some finished, some under construction, and saw what they were doing. We saw the tremendous impact it was having, and the impact that the use was having on the operations side of the Corps projects and the fact that you had better plan for it in advance. And I think we educated ourselves pretty well, went back to St. Paul, and started putting it into effect on a small scale in our planning. And immediately thereafter I got ordered to Mobile, where I hit just as they were into a very large program. I then knew more than many of the experts down there about the forward work that was being done in the Corps in that direction. So there was a real payoff. I didn't even have long enough to forget the people's names.

By the way, for a while I was District Engineer of two Districts. Bill Leaf, the District Engineer in Rock Island, died on his way to his 25th reunion at the USMA in 1948.⁸⁹ He just dropped dead. The Division Engineer in St. Louis called me and told me to go down there and take both Districts until he could find out who was going to replace him. So

for about a month I was District Engineer of St. Paul and of Rock Island, and that wasn't the easiest life in the world, either. I had to sign all their efficiency reports at that time. It was an extremely difficult operation, but we got through it.

And in June 1949 I received orders to take over the Mobile, Alabama, District as District Engineer. The wheel had made a complete turn.

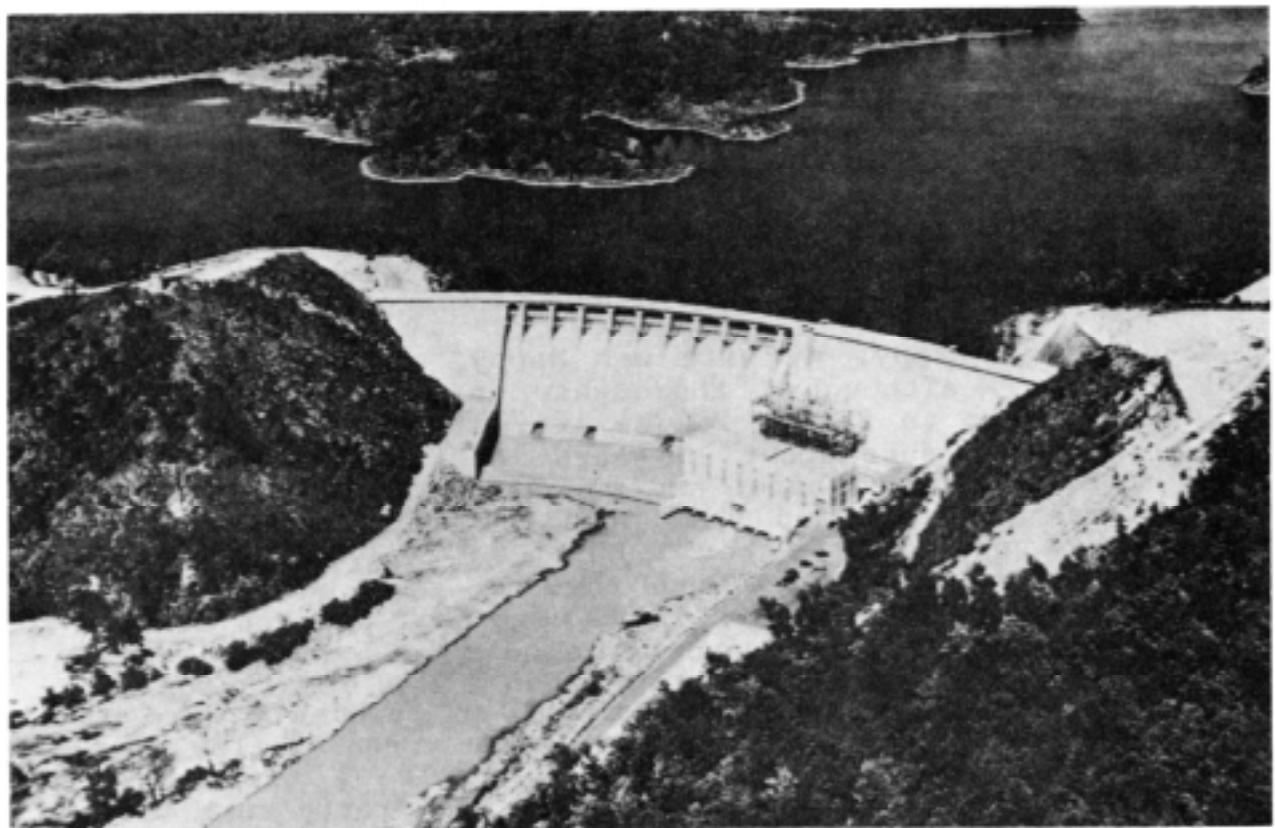
Q: You must have been happy about the Mobile assignment.

A: I was happy, my wife was happy, and my kids were happy, although I thoroughly enjoyed the work and life up in St. Paul. We arrived in Mobile in June of '49, just about 20 years later than when I had first arrived here, and we entered a District which was real big and real proud of all the effort it had put out in World War II. Many of the key civilian personnel were the same ones under whom I had worked in 1929. There were half a dozen of the key branch chiefs and division chiefs who had been in positions of authority when I was looking up at the District from the bottom, and suddenly here I am with them, still the same young fellow who didn't know anything back in 1929. I think they were glad to have me back, but I'm pretty sure they figured they had it made.

On my last trip to Washington before going to Mobile, the new Chief, Lew Pick-he's the one who moved me down there--said that the chief technical assistant down there had been District Engineer during World War II, and he thought he was still running the District. I was to go down and get him under control. There had been one District Engineer since then, but he never could break the system. So I was to go get it back into the routine.

Q: Do you think your assignment to Mobile was a combination of your being the right man for that job and your earlier experience with the District?

A: I don't know. I was in the Chief's office in about March or April. It was the first time I had been there since Lew Pick had become Chief [1 March



Allatoona Dam and Powerhouse, Etowah River, Georgia.

1949], and I reported in to him to be polite and do what I should do. He sat me down and asked how I liked what I was doing in the St. Paul District. I said, "I think it's wonderful." Incidentally, I had been in contact with him in the St. Paul District when he was Division Engineer in the Missouri River Division. I'd had a good deal of contact with him, particularly around the North Dakota area. I said I couldn't think of anything better. He said, "Well, that isn't my question. It's time for you to move. Where would you like to go next?" I said, "Mobile." He didn't think that was a bad idea, and in less than two weeks I had orders to go to Mobile. Now that's all I know about it. I was glad I had built up to it a little bit. Having done the work in St. Paul, I had a little better background to start in getting so-called "control!" of the District.

Q: How did the workload in Mobile compare with that in St. Paul?

A: Oh it was much bigger in Mobile. A much bigger workload and a heavy military construction load as well as civil works.

Q: Could we touch on a couple of the most important projects on each side?

A: Well, there was also a good feud going on between the District and the Division, the South Atlantic Division, which was not very helpful. I got to Mobile and found this going on. They were in the middle of a major construction program. The Allatoona Dam was about a third to one-half completed.⁹⁰ The Jim Woodruff Reservoir was getting pretty well started, and there were lots of other lesser projects.⁹¹

But at Allatoona there had been a great furor between the District and Division over a particular change order. I think we were about on change order number 150 about the time I arrived there, but change order 39 or something was still at issue. Immediately I got a call to come up to the Division office and meet with the Division Engineer, Mason Young, who had been an officer I had dealt with and known before.⁹² He sat me down and told me everything wrong with everybody in

the Mobile District, which was a great introduction. In essence it was "they don't think right, they don't follow the rules of the military or the system, I hope you can improve it." I didn't make any promises because I didn't think that was the way to start off.

Fortunately, as I knew in advance, about a month later Bernard L. Robinson was to become the Division, Engineer of South Atlantic Division.⁹³ I didn't know him as well, but as soon as he arrived I asked permission to go up and see him. I went up and told him what had happened. I told him what I thought of it. I told him that I was aware there was conflict and I knew, as far as I could tell, both sides were at fault to some extent. This wasn't going to make life very pleasant for either one of us if we let it continue. So we agreed that if we had something of real magnitude that we felt strongly about, either side, we'd call the other and discuss it before we let the thing flow up through channels and bring things to a grinding halt. We did that, and after about six months I think we had what you could call a pretty good relationship between the two organizations.

Q: Do you think the conflict involved personalities mainly?

A: Oh, it was the usual thing. You get yourself built into a position where you want to support your man and the other wants to support his man and so on, and you build it up. Personalities, yes, not real personal antagonism but bull-headed on both sides. I think we gained on it.

Q: Well, what was the specific issue of the disputed change order?

A: Oh it was the approval of the extent of certain things and the price to be paid. A variety of little things that were important but not vital. Well, for instance, I found out early and was told that the chief of the engineering division in Mobile was pretty well set in his ways, and that the chief technical assistant liked to just go ahead and give decisions and not bother the District Engineer.

This had happened to me very early in life up in the St. Paul District. Life was real smooth for a while, but I discovered people sticking their heads in the door and speaking to my secretary. And after a while I said, "Minnie, what are those folks coming in here and asking about?" "Oh," she said, "they want to know what you feel about so-and-so and what you'd like to do." I said, "Well, I'm glad to know and I appreciate it. I hope you told them the right thing." She said she told them just what I'd do. I said, "Fine," and immediately thereafter started looking for a promotion for her to be moved up the ladder so I could speak for myself.

Okay, well here I am down in the Mobile District, and it's much more ingrained, bigger, not a conspiracy, it's just the way it had been run. I thought that I had to show them that I knew a little bit about engineering. I kept looking at the plans--you had to sign all these plans as District Engineer, there were a slew of them coming through--and so I kept looking as I passed them on until I could find one where there was a point I thought was worth asking about, and I wondered why they were doing it that way. I thought, I wonder if they know, because I think maybe it should be done another way.

So I called the chief technical assistant in. His name was Herb Collins. He was a helluva fine man. He'd been here when I was a second lieutenant. I said, "Herb, how come we do thus and so on this thing? Look at this drawing." And he got down and looked at the drawing with me. I raised my issue and he gave me an answer. We talked it over, and I said I couldn't accept that. So he got Buck Weston over from the engineering division. Buck came in, and we went through the same act and got to the same place, and he really didn't know either.. And he went to the chief of the design branch, and we ended up with about seven people standing in my office. Then we got down to the guy who really had done this. When I asked the question again to him he told me why. And I said, "Wouldn't it possibly be better to do it this way instead of that way?" He said, "Not only possibly, but now that you've raised it, I think it's quite true, it would be better. Yes, I didn't think about that." He

decided he'd like to go back and think about it again, and of course all of the guys marched out of the room, and that's the last time I looked at a set of plans while I was there. I had established the point. I sure couldn't try to do the engineering in the front office, but it was something I had learned in St. Paul again that came of use down here.

We had a pretty big navigation program in the Mobile District. The Warrior-Tombigbee had been established way back in the early 1900s; little low structures, the movable dams, the kind that go up and down.⁹⁴ The structures were wooden to a large extent. The traffic was picking up a little bit, and it was getting pretty dangerous to keep those things going. They were getting pretty worn out. So we were in the program of designing and getting ready to build a dam at Demopolis to replace three or four of the old ones upstream as the start of an improvement. That was a fairly good-sized project.

Unfortunately, the bidder who was low bidder was primarily a military construction outfit rather than a dam builder. I called him in before awarding the contract and said, "I have no excuse for not awarding the contract. You've made bond, you've got good capability, but I want to advise you that you ought to hire somebody or merge with somebody that knows something about handling water because this is going to be different." He said he knew all about it. I said, "No, I know the second bidder, a contractor from Minnesota, and they are good and they handle water. The bids weren't too far different, and you'd do well to try and take him on." But no, he wouldn't do it, so we awarded it. He didn't give the resident project manager enough authority. He didn't do the things you need to do in working on a water project. So just a year later he came back to say that if it was all right he was going to let Al Johnson Construction Company take over and finish the job at no increase in cost. That's who I had wanted him to meld with to begin with. This one was a pretty good exercise, and it worked. They built a pretty good job and we got out of a problem by not having things failing.

At Jim Woodruff Dam we had a terrible time with the foundations because it was limestone and there were caverns. It was pretty tough, and you couldn't tell what was there. We had an awful lot of dental excavation in excavating for each block in the dam because you come to different levels, and you clean it out to a point, and still there was a little rotten spot over in the corner. And you'd get in there with dental work and get it out, and it would open bigger and bigger until pretty soon they'd say. "You've come down this far, you might as well take it all out." And of course dental work was at one price and ordinary excavation at a considerably different price. This went on, and there were hundreds of photographs taken. Soon we had a great conflict going on with the contractor [Perini Corporation]. Our resident engineer and their project manager were just set in concrete on it.

I finally invited Lou Perini [the corporation president] to go out with me on the division's boat that was there for the moment and [to] stay until we could solve it and [to] bring his project manager with him. He could bring an engineer but no lawyer. We were going to do the same. So we went out in the boat in the intercoastal waterway over in Choctawhatchee Bay near Destin, and we cruised around; worked hours looking at these photographs trying to make up our minds and trying to reach some kind of compromise. When we would get kind of mad at each other, we'd stop and go fishing or go swimming, and then come back and do it some more.

We didn't make much progress, so finally I said, "Lou, I think we have just got to take each one of these things and go down and arbitrarily agree on a level. There's no way in the world now that it's dug to prove it. There certainly is a lot of excavation that is deliberately dental, and now we're trying to pay you for it in general excavation, and on the other hand there's a lot of work that you are claiming dental excavation for that really shouldn't be." He agreed but wondered how we could reach it. So we just sat there with these two guys with us, and we hammered it out, and we reached agreement on each one. We made a change order accordingly. When Perini got back to Boston, he called me on the phone and said, "Well, I don't

know what you think about it or what your folks think about it, but my lawyers tell me never to get on another boat with you!"

Q: How much business did you do with out-of-town contractors? That's not unusual, I know, in other places.

A: Well, the one at Allatoona was from Baltimore. These were primarily dam builders who had experience in that field. Well, anyhow, there were innumerable projects of that kind. While I was here we went on to start design on one or two replacement structures. To show you why it was necessary, I was up in the Warrior River inspecting when we were dewatering one of our old locks and dams, just the lock, to do some repair work to keep them running. Remember I told you that the top of the dam was movable? Well, in high water the boat tows would go over them, but every now and then they'd still go over after the water had gotten a little too low, so there would be a sag or two in the thing. Well, while we were looking down into this little bitty old lock chamber--there were about three or four workmen down in the bottom with picks and shovels working away--a catfish about three feet long swam through the wall! There were timber sides to the thing, and they had rotted out. That fish swam through, and the workmen were all going after it to try and get him with their shovels and picks. I thought if I ever needed an example of why we needed to replace these locks and dams, I knew where I'd find it.

The Mobile District was responsible for civil works in about a half of Mississippi, three-quarters of Alabama, half of Georgia, the panhandle of Florida over near Tallahassee, and a teensy little bit of Tennessee. But in military construction it had responsibility for all of Mississippi, all of Alabama, a good share of Georgia including Fort Benning, the panhandle of Florida including Eglin Field, and Tennessee. It was a tremendous area, and with the fracas in Korea they suddenly needed to refurbish the ammunition plants and ammunition loading plants, and warehousing, and tank repair. There was a requirement for more barracks space and training space and so on in places like Benning and McClellan. And at Eglin Field there was a big

burst of activity. So all in all our military construction program was tremendous and took a vast amount of effort, and again proved to me the desirability of the system where the Corps of Engineers does both kinds of construction. When an emergency arises you can shift a going organization, people who know each other, people who understand the procedure.

Q: Did you expand at that point by bringing a lot of people in from the outside?

A: Some, but more and more we got more contract work. We got a little bit from the outside, but mainly we shifted inside because the civil works appropriations dropped off. The knowledgeable people were there to be moved around without really moving. It was a tremendous payoff to me. I hadn't been in that situation in World War II. I had read about it, and I believed what was said, but now I knew it. I mean I had read how it had helped in World War II.

I had a very interesting thing show up in military construction. I got a phone call from the Chief's office on a Friday saying that they wanted me to come to Washington Monday morning: to be there to negotiate a contract with a combine which I was to put together and have show up on the spot on a classified project. I wanted to know what kind of project, but they said it was classified and they couldn't tell me. I said, "How do I put some combine together if I don't even know what I'm talking about." They answered, "I don't know what you're going to do, but you have got to do it, and you'll be here Monday morning." I asked about several different things, and when I said "oil refinery" they said, "Now you're talking. You come up with people that are capable of building an oil refinery and we could probably do business."

So I immediately called in all my boys and we really puzzled over it. We put together a combine that comprised an earth-moving outfit, a mechanical outfit, and a general construction outfit. We met in Washington and sure enough that's what was needed. So when I got to the Chief's office, I asked what they were going to do. They said, "We? You're going to negotiate the contract. You are

going to be the contracting officer." Whew: And I knew nothing. But it was going to be CPFF [cost plus a fixed fee], and we had confidence in these people.⁹⁵

Jerry Galloway was the man from the Chief's office who was responsible at this moment.⁹⁶ Between us we negotiated the terms in some detail. We didn't know what it was about. To this day I can only guess what it was. I'm rather well sure what it was. It was in the nerve gas field, and we were the first step and the second step was going to go on out in Denver under General Sturgis as Division Engineer out there. But this was a real hot project and presumably had the presidential approval to be at the top of the list and everything was go-zoom, zoom, zoom. There couldn't be any delays. Here I was. I had a Division Engineer in Atlanta, but the architect-engineer people and the operating people, who were the same, were headquartered in New York. so the North Atlantic Division was supervising their contract. The Chemical Corps was involved in it. And if you want to get into something quite similar to what I described in India in World War II, well, here we had it again. I asked for an experienced resident engineer, preferably a reserve officer on extended active duty, and got one, and he was good. The rest of the staff we more or less took out of our hide here in order to get the thing going pretty well.

It was up in Muscle Shoals, and we got it started. Oh but it had its problems in design and plans, but we were still under orders to get the damn thing built and not show any delay. We were to work overtime. We had to build a thing we called a phosphate works, which was a cover name. We didn't know what the real product was to be. We had an adjoining chlorine plant to be built under an Italian patent. We had to follow certain requirements of their patent in order to build it. The early part of the work went pretty well and easily: Let's see, Creighton, Daniels, and Moss were the contractors. They are from Birmingham and Tennessee. They came along pretty well. There was a big demand for labor at that time. The project was full of special materials, stuff that you couldn't get anytime very quick.

But they got going, and after about three or four months we got word from the Chief's office that Mobile District was no longer in it. This was too confusing to try and run it the way it was being run, and . . . I concurred completely. We would cut loose, and it would come directly under the North Atlantic Division. I said, "Now, wait a minute, we put our people up there on this thing. Are you going to tell me we don't have the right to even talk to them?" They told us to phase ourselves out gradually. We had a right to step in and protest if we thought something was not being done properly until the thing got rolling better. They said, "Yes, you should protect your people and look out for their interests."

So it went on. I told Lieutenant Colonel [Paul] Long, the area engineer, if he really got to a point where the requirements were pretty bad to call me, and I'd come and see what I could do. It went along, quite far along, and was under a mandatory overtime requirement. Everybody on the project worked overtime. That's the one way you got them and kept them to a large extent. But it looked like any other chemical plant. I mean everytime I go near a chemical plant there's a bunch of pressure vessels and expansion vessels, special pipe, and steam vents, and things going out in all directions.

I got a call from Colonel Long, who said, "We're just pouring money down the rat hole. It's just killing me, and we ought to stop but I can't get the Division to let me. We're paying overtime. We don't even have the materials on hand to see what we are going to be doing next week." So I decided to go up to the job site. We had a big room, and there were about 50 people around the table. There were some from Chemical Corps, and North Atlantic Division, and some from South Atlantic, some from the Chief's office, an architect-engineer team, some of the top people in the contractors, and me, and, of course, Long and his staff. We got into it to try and see what could be done. I got a general feeling that everybody really felt we were wasting money on the overtime because we weren't able to plan properly. But they all pointed out each time, "This is a presidential project that's been said to go ahead and nothing, nothing must slow it down."

They said, "The President is not going to call off the overtime. You are going to have to keep doing it."

Finally after about three or four hours, I said, "Okay, gentlemen, here's what's going to happen." (This was about a Thursday.) "I'm going to make a decision right now that on Monday the overtime stops except for project items which you know you need, and you know you've got materials enough ahead to keep working for a full week. Overtime without materials on hand is going to be out. Now I don't clearly have the authority to make this decision, but I'm going to make it. I'm notifying each of you visiting firemen that you may go back to your offices and all it takes is to get a telegram to me. I don't want it in a phone call, I want it in writing, saying you will reverse that decision. Just do that, and it will be reversed right that minute. But if I don't get something in writing by Monday morning, unprofitable overtime is going to stop. Now, do you understand that?" They said they did.

Well, there were great screams of anguish, you couldn't do this. The Chemical Corps said it was terrible, but I said, "Okay, you know the terms. You'll be home tonight and tomorrow, Saturday, Sunday, and Monday, you can telegraph." Well, come Monday morning, I had no telegrams. I'd had a lot of phone calls but no telegrams. So I called Colonel Long and said, "Okay, do you understand? If so, go ahead." Do you know, in about ten days we got down a directive stating that overtime would be stopped except where it was essential: So somebody just had to take the bull by the horns and do something to raise the issue.

Now the project was finished in somewhat good shape. I don't know that it ever accomplished much. I don't know, because we were never told what it was about. But the phosphate plant was turned over to TVA for whatever use they could make out of it in their fertilizer business, and the chlorine plant was sold to somebody after the war, too.

Q: It's a real challenge when you don't know what the work is for!

A: Incidentally, during my service here, we did have the groundbreaking for the Buford Dam, now Lake Lanier, just north of Atlanta, which happens to be [one of] the largest public use reservoirs in the hands of the Corps of Engineers.⁹⁷ Again, what I had learned out in Tulsa and Little Rock was useful in getting organized on that because it was obviously going to be the kind of reservoir that was ideal for public use. It has shown so ever since. It ranks number one every year. I have forgotten how many million visitor days, but there's a heck of a lot of them. In fact my family goes up nearly every Labor Day and goes sailing on Lake Lanier.

Q: Is there anything else you want to mention about your assignment in Mobile?

A: Well, yes, there is one feature I think I should bring out. While I was still in St. Paul, but announced as next District Engineer for Mobile, I received correspondence including a draft advertisement for selling a lot of land up at Huntsville. Mobile District wanted me to approve putting the advertisement in national magazines. The land in question was either the Ordnance or Chemical Corps depot. I don't remember which. It was being surplused and scheduled to be sold, and the big problem was what would the rights of former owners be? Would they get first choice or not? I sent them back posthaste and said that whoever was acting District Engineer was responsible for making decisions until such time as I arrived on the scene, so let him decide. I stayed out of that problem until taking over.

But I did take over, and this was one of our hot projects. We were in the throes of selling this half of the two Army installations when suddenly it was announced that von Braun and his crowd were moving over there from El Paso.⁹⁸ So the surplusing was withdrawn and all the money and effort put in on these ads and the other planning went down the drain.

About six or eight months to a year later, in 1950, I was notified that a civilian just outside my office wanted to see me. They said that he sounded like a German. He spoke broken English, and he had

something he wanted me to do. I told them to bring him in, so they did, and it was von Braun. I spoke with him and he told me he had something he wanted the Mobile District to undertake. I didn't know whether we should or not, so I said, "Would you mind if I brought in some key people to listen to you?" He didn't mind. So I brought in about 15 people, and we sat in the conference room. He kept writing and drawing on the back of an envelope, and I kept slipping him a pad of paper, but he would push it away and go back to his envelope. I wanted something to refresh my memory when he left because he spoke pretty broken English at that time, and I couldn't understand too well. But I gradually hoisted in that he wanted us to design and build something that could hold a vehicle that was going to be capable of going to the moon, but when you fired it this stand was to be able to hold the vehicle in place so the engines could be tested and observed and evaluated. Of course, this was something I had never thought about, nor had my staff, but we dug out of him all we could. We said we could undertake it if OCE gave us a directive and funds. He said, "That's fine, you'll get them." Sure enough very shortly thereafter we received instructions and funding to pursue the project. We hired the Parsons engineering firm out in Los Angeles as the AE, and so we in the Mobile District got involved in the missile business during 1950.

Q: Which is much sooner than you usually think of it starting.

A: Yes. We learned that von Braun was a real sharp cookie. One thing that particularly impressed us was that he never called on us to build a facility for him that couldn't be modified for the next generation. Thus it could continue in use year after year, and vehicle after vehicle. I think they're still using that first test stand at Huntsville. It had sleeves going through it so many places it looked like a birdcage, but it was set up to be modified as we went along. Whereas for the Air Force, we normally built a facility just to fit a particular missile. When that missile went down the road a ways, the facility was no longer useful.

We gained lots of experience building these things and getting into the thinking about it. This was the first time it dawned on me to think in these terms. I knew about the V-1 bombs and the V-2s. Both types had been in evidence on my trip through England and Belgium. As a matter of fact, both in London and Antwerp I had learned to seek cover in a basement entrance when the V-1 motor cut off and the click, click, click could not be heard. And on my way to visit a POL [petrol, oil, and lubricants] depot in Antwerp, we were running out of time and the officer guiding me said, "I think you better head back to Brussels because the visit to the depot will take too long to let you reach Brussels before dark." When we got to the edge of town they had a phone call waiting for him and there had been a V-2 bomb hit the depot about the time I would have been there. But I had just never thought of having any connection with such a weapon since.

So the Mobile District got started early into this aspect and then later on down the road, bingo, I run into the same thing again in positions like assistant chief for military construction, deputy chief, and Chief. I would run into von Braun again. It's just amazing how often these trails open up and keep crossing one another. I don't know that there is anything more that's vital, probably is and I don't know about it.

Q: Since you went from Mobile as District Engineer to Atlanta as Division Engineer, I would like to ask you to comment on the different roles as District and Division Engineer. Also, how did your work in those positions prepare you for your later assignments in OCE?

A: Well, first, from my point of view, would be the sudden shock of being ordered to Atlanta to become a Division Engineer. I had had three years in St. Paul District and just completed three years in the Mobile District, and here I was going to another rivers-and-harbors-type assignment. I had never thought about anything like that. But I went up to the Division and Colonel [Harry L.] Fox, who had been the deputy up there and whom I had known out in India--he was in General Farrell's engineering section in the theater headquarters--came down here to be District Engineer. Well, now moving from one

District to a Division in the same place, I recognized right off the bat, particularly after the history of minor conflicts that we had had and pretty well overcome, boy they are going to test me! So I went up there and reported in. And the first day I was sitting at my desk and the first piece of paper to hit me was a turn-down by the Division waiting for the signature of the Division Engineer on something the Mobile District had been trying to get worked a certain way for months and months.

Q: That would have been while you were the District Engineer?

A: Yes, while I was here. I had talked with the Division Engineer by phone and visited, and we had tried all kinds of things. Well, on this particular one I wasn't getting anywhere. So there it was for me to sign back to the District saying "no." I thought there was only one thing to do, so I signed it. I didn't say a word to anybody. Two days later the phone rang and it was Harry Fox in Mobile. He said, "Weary, did you sign this endorsement?" I said, "Sure I signed it." And he said, "What the hell?" And I said, "Harry, you've been down there three whole days. Haven't you straightened that District out yet?" That was the end of it for about three months and then I gradually seeped it back into the process and discussed it with him. But rather than start off by having a fight with my new crowd, I worked it that way, and it worked out pretty well.

Q: And the Division had decided before you came?

A: That's right. They were waiting. They had decided, once that I was announced as the Division Engineer, it was better to have me sign it than my predecessor.

But anyhow, it was interesting to move into the Division that had been supervising me. I went up there along about September. I left my family in Mobile because school had started, and it was too late to move the kids. I lived out in the BOQ at Fort McPherson. I devoted most of my time to getting around to the rest of the Division and visiting every project. I just about accomplished

that when the first of the year approached, and I went up to the Chief's office. Sam Sturgis was just coming in. I met him again. We had been talking back and forth of course on this project at Muscle Shoals. I told him I couldn't believe I was going to stay very long in Atlanta because I have had three this and three that. And he said, "Oh, yes you will. Why not, it's a good idea." Well I said, "I haven't moved my family. They're still sitting in Mobile." He said, "Move them. Move them." So I moved them.

About the first of January we found a house to rent. It was a terrible struggle, but we got it. I just got them in there, and I had to go to the Chief's office to a rivers and harbors board meeting. I got in and they said, "Sam Sturgis is looking for you." This was in late January, so I went to find the Chief of Engineers designate, and he said, "By the way, glad to see you here, because I want to tell you that you're going to Morocco." This had only been about four months by that time. Well, it was about two months later when I left the South Atlantic Division to go to Morocco and left the family sitting there again.

Let me put it this way. The District job is probably the most exciting and fun job there is, and the busier the District the more fun it is. The Division job however, has got a lot of challenges but you are a little farther away from the work. It's more paper work than the physical work. But it opens a tremendous area for you to cover and a lot of senators and governors to know.

Q: Did you spend a lot of time on visitations?

A: Yes, but you are once or twice removed. But it is interesting, and certainly you can call on all the experience you have had in the other assignments to make it possible to do the other job. Division Engineers have a tremendous opportunity to develop the talent that is in their hands on the part of the civilian employees and the District Engineers and the military people. The Division Engineer can have a big influence on that if he works at it, and he doesn't have to if he doesn't work at it, but it's an opportunity.

Q: Was it usual to go from a District within the Division to become the Division Engineer?

A: You seldom do. It's unusual.

As Division Engineer you have got a broader aspect. You stand off a little more, and you don't have quite the personal involvement. You don't have to feel like each one of your boys is exactly right down the line. You do go on things like the rivers and harbors board, which gives you much greater opportunity to grasp the picture across the whole country. You have to vote on these projects and correct them and so on. You get involved in calling on the military commanders. Of course, you do the same thing as a District Engineer, but you have got a much broader field and the Air Force as well. You have an opportunity to be influential with the various governors. You have a much broader scope than you did as a District Engineer. You have two things: you feel a little bit away from the job, so it isn't quite as exciting: but you also can look at it a little more dispassionately than you can as a District Engineer.

The fact that I had been District Engineer in Mobile made it easier to move into the Division because that was one of the largest Districts in the Division, and frankly I had to stay out of it to not continue to be District Engineer. So it made it a little easier that way to cover the rest of the Division. And, of course, the people down here in the Mobile District felt like they had a friend in court for a change.

Q: What about those experiences as background for your later assignments in the Chief's office?

A: Well, it was ideal training for moving into the Chief's office, which was not a place I ever wanted to move into. I wasn't particularly enamored of the Washington scene. It was fun visiting there and getting involved in things.

Q: Is it a dream of the Division Engineer to move into the Chief's office?

A: I don't know. It's a personal thing, I guess. It wasn't mine.

Q: Do you want to say anything more about your feelings about life in Washington?

A: No we'll get to that. I'll tell you. I was somewhat shaken when I realized I was heading for Morocco when they were just in the throes of all the investigations by the Congress into the complaints of waste and inefficiency.

Q: What was behind your getting selected to go to Morocco?

A: By then I was pretty experienced. I administered quite a few cost-plus-fixed-fee contracts. I might add with interest that I never had a claim settled by the board of review for claims in the Chief's office. I always managed somehow or other to stop them from reaching that stage and discussed them and cleared them up and solved them without going there, which I'm proud of. But it could mean that I must have been too easy. I don't know; I don't think so.

I had one [claim] while I was in the Mobile District; Jim Woodruff [Reservoir]. I don't remember what it was about, but I do know that I sent it up through channels, and it hit the Chief's office. [Manning E.] Manny Seltzer, the chief of the legal division, called me, and said, "Weary, what in the hell are you doing sending a claim in here?" Well, I told him I couldn't get it worked out because my people told me I couldn't do some of the things I wanted to do. He asked what I wanted to do, and he said, "Damn right, you can do that. If I send it back to you, will you solve it?" And I said, "Yes, sir," so he sent it back to me, and we solved it.

Q: Your own legal staff had told you that you couldn't do it?

A: Yes, and I didn't want to overrule them if they gave me their advice.

I was concerned about going into Morocco. In essence it was like coming from a pleasant country club experience and going out into the desert in a windstorm, if you know what I mean.

But promptly on arrival in Casablanca I was confronted by a problem which took up all my time for about a week. I landed in Morocco after there had been a team from the Chief of Engineers' office there for nearly a week. If I remember rightly, it consisted of Johnny Hardin,⁹⁹ who was the assistant chief of engineers for military construction, and a team of experts, plus a board of pavement consultants, who were all high-level people--Porter, from Porter & Urquhart; a man from out of Texas A&M: Bob Philippe from the Chief's office--and the Division's key pavement engineering expert, a man named Christensen, was also a member of this team. But they had been running around looking at everything and uncovering all the mistakes, lifting up all the corners, and here I arrive.

If I remember correctly, I got in there on a Friday and the first thing Saturday morning I drove to Sidi Slimane to join this group.¹⁰⁰ They had now reached that particular airfield. So I come in, I knew some of them, but everybody there knew more than I did; everybody. And everybody had their own solutions. I stayed with them all that day. When we finished there and went back to Casablanca late Saturday, I stayed in a little family hotel, and I hoped fervently that this big team of experts was going to spend Sunday relaxing on the beaches. I had a key and went over to the Division office and spent that Sunday alone, just trying to read into things, to find out. Sunday night finally I went to bed intending Monday to go back and start again.

Sometime in the morning, maybe four o'clock, a man shook me and woke me up in my hotel room. I had never seen him before, and he said, "You don't know me, but you're going to have to take me on trust, I'm your G-2 and I have certain missions to do over here. You'll find out about them ultimately, but among other things I'm going to try and alert you to something. Your group of consultants, driving back from Sidi Slimane late Saturday night, ran over and killed a U.S. airman. The U.S. Air Police have discovered this and have traced it and found the car, and these are your top-level people. I don't know what you're going to do about it, but you better be aware of it."

I didn't know what to do. But I spent that whole week trying to keep these people out of the hands of either the Air Police or the French police. I met with them, and I found out what had happened very quickly. The man that was driving the car was the Chief of Engineers' top man in this board. They were all tired and sleepy, and the driver was the only one awake. At some point, a few miles from Sidi Slimane, they all felt a little bump that woke some of them up. That's all they knew. I ultimately found out, and the Arab police found this out, of course, that this airman had been drunk, that he had wandered out on the public highway, that he'd been hit and killed by a prior car, and all our car had done was go over his dead body, but this was not known at this stage. As I say, I didn't particularly want these pros turned over to the Air Force at that moment, and I didn't want them turned over to the French.

Our solution was to work with the U.S. consul, and I had a lot of help and a lot of people working. At any rate we succeeded in getting the consular court to take it over and talked the French into letting the consular court have jurisdiction; talked the Air Force into not doing any more about it than that. In about a week, we got permission from the consul to ship these experts home, and boy, I shipped them out of there. But this is the way I got into that Division, and instead of having that week and the opportunity to really talk with Johnny Hardin and the others from the Chief's office and find out the technical thoughts and so on, I spent my first week, literally, keeping these guys from getting lynched or railroaded or put in jail or something. So that didn't make life too easy.

In mid-April General Sturgis had assigned me as Mediterranean Division Engineer in Morocco. En route, when I was in Washington, he and his key staff had planted in my mind the "seed of conversion," the idea of changing the current cost-plus-fixed-fee contract into some form of lump-sum and unit-price contract. General Sturgis told me, as I remember it, that if I found it to be advantageous, to then plan to return promptly to Washington in June and present my ideas and backup and financial requirements and whatever we couldin

order to see whether we should present this to higher authority and try for authority to do it.

One of my first moves on arrival in Morocco, after the first few days, was to ask one of my Mediterranean staff to present me in a couple of weeks [with] a study presenting the pros and cons and recommending the proper course of action for such a conversion. Lieutenant Colonel Curtis Chapman headed the team that studied it.¹⁰¹

In a couple of weeks the study was presented strongly recommending no change in the contract form. I thanked them and told them I thought they had done an outstanding job and said I was going to be gone for several weeks to visit Turkey, Saudi Arabia, Eritrea, and the Libyan portion of the Division, and would they please prepare just as thorough a study emphasizing the positive thoughts toward conversion. I wanted to really see if there could be anything there.

Q: Were you leaning toward making a change?

A: Well, the more I thought about it the more I couldn't see any other way to get a handle on the problem. Now, if it were clear that all the experts and technicians working for me were telling me that it shouldn't happen, then I wasn't going to force it. They had come up with a well-thought-out analysis, showing pretty conclusively that you had better not try and change it. That's when I said, "Okay, I'm heading for Tripoli and Turkey and Dhahran and Eritrea, and it will take two or three weeks. When I come back, I'd appreciate a study as thorough as this but looking at more positive aspects of doing it, seeing if there isn't some way we can make it work as a tool to get out of the problems we are in."

When I returned to Casablanca, the study showed potential for and benefits in conversion. Additionally, the Division had used the extra time to refine their funding picture. So with the approval of General Sturgis, Colonel Chapman and I took the study to OCE in June with a request for additional funding to carry out the then-authorized program. After about ten days of thorough review in OCE, at Secretary of the Army level, with Air

Force, JAG [Judge Advocate General], and G-4 attendance in the meetings and with DOD blessing, my party and I received the authorization for additional money, legal and contractual advice, and approval in principle from the Chief of Engineers to proceed and attempt to negotiate a fixed-price and unit-price contract to complete all line items under way and price out supplies and equipment expected to be surplus to these line items with a conversion date of midnight, 31 July 1953.

I was given permission to accompany my family back to Casablanca by transport, and arrived about the second or third of July. [See appendix B for Dr. Richard Farrell's interview with General and Mrs. Wilson.] I was met at the gangplank by a delegation including my deputy, Colonel Swede Carlson, and Chapman, who had flown back.¹⁰² And they said, "We have bad news for you. We need ten more million." I don't know that I have that written down any place, but they said it. And I said, "Who else knows it but you?" And they said, "Nobody." And I said, "Well, nobody's going to know it right now. Just keep it to yourselves. We're going to straighten this out, and we're going to chase it down, and we're going to get credit for materials and items that are here but that we can't locate right now. We're going to find them. Let's not raise the issue now."

Q: Not too much is usually said about the other projects or activities of the Division outside of Morocco. Could you say something about what was going on in Tripoli, Saudi Arabia, Turkey, and Eritrea? What kind of things were you doing there?

A: In addition to the District in Morocco, which was the East Atlantic District, the Division supervised the Middle East District, with headquarters in Tripoli, and TUSEG, which was the Turkish-U.S. Engineer Group, in Turkey. Now starting in TUSEG, that had been going on, off and on, for some little time and going from one supervision to another. But since the Mediterranean Division was formed, it had been under the auspices of the Mediterranean Division. It involved half a dozen airfields in Turkey; some radar sites. It was kind of like a little District. It wasn't exactly a District. It had grown up under different auspices, but it was there and it was effective.

By the time I took over the Division, a man named Jakitis was the District Engineer. They had one big field down near where Saul of Tarsus came from. It was very effectively made use of at the time of the Lebanon exercise. It was the airfield in south Turkey that logically supported the operation into Lebanon. It was interesting to me because Saul of Tarsus has always been one of the people I was interested in in the Bible. Paul--and his little town of Tarsus -- was probably 15 or 20 miles away from this airfield. They covered a good share of Turkey. It was involved in NATO desires and things aimed at listening and so on in Russia.

Q: And the Corps built the facilities?

A: They were built under contract, a CPFF contract again. The Corps was supervising it.

Q: Did they handle maintenance too?

A: No it was turned over to the Turks. If they had any real problem we would probably get back and help them. But it was a joint agreement.

Now, going back to the Middle East District. The headquarters of that was in Tripoli, and Paul Troxler was the District Engineer when I first got there.¹⁰³ He was experienced out in that part of the world. In Dhahran, in Saudi Arabia, we had the Dhahran airfield, which was being enlarged and maintained constantly at the time I was there. It was a key airfield on the route to India. We always had something that had to be done there. We had three water systems: salt water, well water, and drinking water. It was a helluva project, and it was interesting to go there because occasionally I was able to see the Saudi Arabian court. They visited Dhahran once a year, and ARAMCO [the Arabian-American Oil Company] would send 30 or 40 families home on leave so they could take their houses and turn them over to the princes. Even today, looking at the landing of President Carter at Riyadh the other day, I saw the Oriental rugs on the sand. Well, I've seen 20 or 30 rugs there at Dhahran, beautiful things.

They were getting ready for some big shot to come in once when I was down there, and I went to the

little terminal which we had built and sat up on the counter to stay out of the way. The bodyguards came in with curved knives and guns slung across their backs and cartridge belts over their shoulders, and their faces scarred from fighting with the knives. They were slaves and once you took on a slave he became your responsibility. You had to feed his family and so on. They came in and looked the terminal over, inspected all the people, and spread these rugs over the floor. It was an interesting situation.

Alcohol is not legal in Saudi Arabia. Fortunately, I don't drink anything except a little wine or beer, and I don't do that unless there's an occasion or a party and others are drinking. So this ban did not bother me much. But the people over there who wanted something else really had a hard time. And our contractors had a hard time keeping their skilled labor satisfied without running into difficulty with Saudi police or officials.

Once, while I was in Dhahran, I was told that two of our contractor's workmen had just been put in the jug for importing liquor into Saudi Arabia. It wasn't that they were stupid enough to bring liquor into the country. But they sometimes flew to Bahrain Island, where the ground rules were less demanding, to spend a pleasant weekend. These two workmen were returning from Bahrain, and when they got off the plane one of them showed signs of having had too much to drink. He did a little arguing and shoving and pushing, and the other one tried to calm him down and get him out of there but didn't succeed. So the Saudi police picked them both up and charged them with importing liquor, and it was inside their tummies! I wanted to know what we could do and was told we could ignore them or go to the jail and take them blankets and food and try and work on the government and see if we couldn't ship them home. That was the only thing, so about three days later we shipped them home.

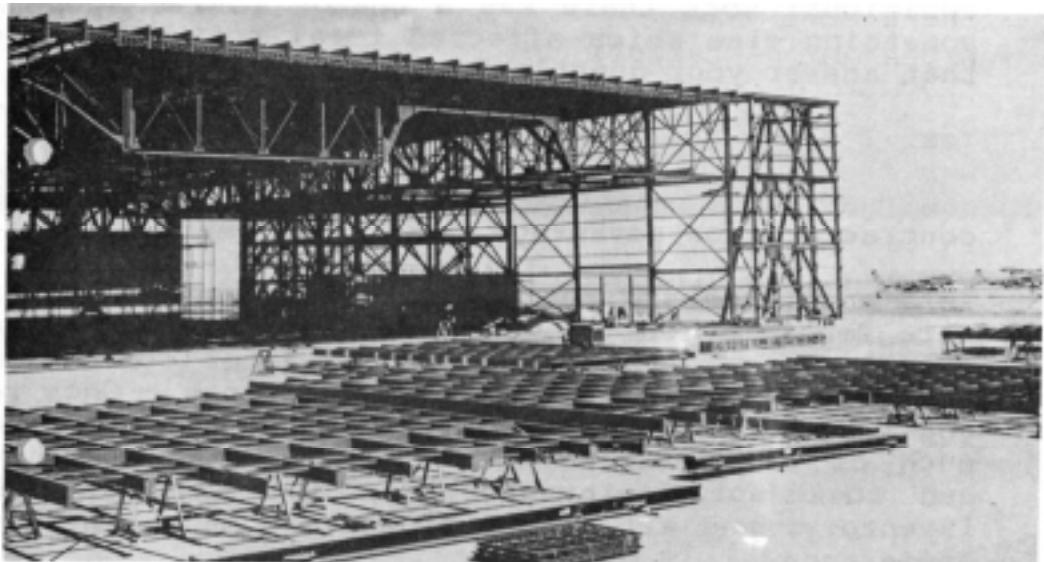
It was interesting. It's much different now, I can tell by looking in the paper and on the TV, tremendously different. There were a few wives over there, none of ours except our resident engineer, who was authorized to bring his wife over

there on a two-year tour. They didn't dare let the wives drive because if they were in an accident they were automatically at fault. Any American involved in an accident was at fault, and they didn't much want their wives in jail. It was a tough place to build, terrific temperatures. Usually in those days you took off before daylight in order to take advantage of the cool air in getting the plane off the ground.

We went from there over to Asmara, Eritrea, which is on a 7,000-foot elevation plateau right above the Red Sea. It was a communication facility for the Army, and it was an ideal place for it. It had uninterrupted connections with pretty near every place in the world because of this altitude and the lack of higher elevations in the area. It was a summer climate at 7,000 feet, so it was ideal. It was a large, extensive facility, and the U.S. was always adding to it the whole time I was in the Mediterranean Division, and long after when I went back as deputy or Chief I found they were still adding to it. I think it is now no longer ours, probably progress has made it possible to let it go, I don't know. In Tripoli there was a major airfield, Wheelis, for the U.S. Air Forces, and that's where the Middle East District office was located. That's basically the two Districts that we had. What would you like to talk about now?

Q: I wanted to ask you about Boulhaut Airfield, where \$5 million was saved.¹⁰⁴ Do you want to say anything about how that was accomplished? Was it because of the change in the form of contracting?

A: If you're talking about as a result of conversion, that would probably be it. In essence the ultimate costs for that originally converted work approximated the estimate that the Division had prepared in the beginning, but we couldn't have done that without giving the contractor confidence that if he went ahead and let people go and really cut back he was still going to make enough money to come out whole. Again, we couldn't have done it if the savings hadn't been plowed back into the job to give more work on which the contractor could earn an honest dollar of profit. But I'm not going to try and get into the numbers game, I can't remember, and again, every time we negotiated



Hangar Construction at Ben Guerir.



Portion of a Pipeline Linking Ben Guerir and
Under Construction, 1953.



Concrete Block Plant, Dhahran Airfield, Saudi Arabia.

additional work there was a change in the scope or something- else which affected total cost. Now does that answer your question?

Q: Yes, I think so, because you said that you think it was the change in contract administration, and this was the first major conversion, and you and the contractor took advantage of all the improvements.

A: It's a little hard for you to understand, but there were something on the order of 4,000 Americans that came home in the first six weeks after conversion, and they averaged well over \$500 a month. Once you got off the CPFF and eliminated the necessity for much of the detailed recordkeeping, and guarding, and bookkeeping, inventorying, and adjusting the inventory, and all that business, it made a helluva difference.

Now why did they do it before conversion? Because the ground rules under CPFF are such that the contracting officer must require the contractor to do it. And when we changed to lump sum with different requirements, the contractor just figured he would guard it as well as he could economically. On a job this scattered and extensive he would expect a little pilferage anyway. Again, the real secret is that if he needed another widget that he couldn't find in his stock, he could fly it over and pay through the nose for that one trip, but that was a lot cheaper than keeping 20 of those widgets overseas and counting them, patting them, and maintaining them all the time in order to be sure never to be short one. But as a contracting officer, if they had come to me and said, "We have to fly an engine for a Caterpillar tractor out here now," the answer would be, "Well, fly it. That's at your expense because you should have foreseen that and shipped the engine in time to get it here by routine methods." And you can't help it, that's just the way it is.

At the last minute before conversion we were using a lot of people to inventory. You realize that we had to convert from a CPFF to a lump sum at midnight on the 31st of July with supplies in the warehouse that were earmarked for that job, with progress on the job having to be estimated; what

percent complete it was. It was almost impossible to be accurate, almost impossible. The biggest thing the contractor had to satisfy himself was that he had enough in the warehouses, plus a jillion more, that would cover him for the next six or eight months so that he wouldn't run out of too many items required in the specific line items being constructed. Again, there was a matter of confidence. We and the contractor got together pretty well. And he and I agreed that you're not a crook and I'm not a crook, and you want to make this job smell good, and I want to make this job smell good, now let's get with it. So in essence I told him that in my opinion I was going to accept initial conversion prices higher than I believed he would be justified in keeping in the long haul, and he was going to think it was less than he ought to get. But I was convinced that he was going to have enough to get by on, and I was expecting him to return what he could because we could plow it into additional line items. We would take it away anyhow in the renegotiation era if it was excessive. It worked. The morale got better. It made all the difference in the world. The work goes smoother and you save time. What else do you want to explore?

Q: Well, would you care to go into some aspects of the relationship with the Air Force, some of the problems you encountered. In your interview with Dr. Farrell [See appendix C] you said that the Air Force commander tended to go to the Pentagon and back to the Chief's office with his complaints instead of through you.

A: Yes, that's a fact.

Q: But was it a question of the Air Force wanting to have more control over the construction related to their program?

A: Yes, they wanted to get rid of us.

Q: Didn't you have that same kind of problem in China and Burma when the Air Force was still part of the Army?

A: Yes, that's right. As I mentioned, the Air Force Installation Representative (AFIR), the Air Force

officer that was directly connected with us to speak for the Air Force, not for the command primarily but for the whole Air Force, was a pretty good man. Ultimately he went from Morocco out to Colorado Springs to be the resident man directly in charge of construction of the Air Force Academy.

As I said, Colonel Barnett was a pretty good man, and he tried to play fair. He didn't try to find things that we could get tripped on. He tried to keep us from getting tripped. But aside from his staff, who were pretty good people, he was about the only Air Force type that gave this impression. And I realized that Barnett was considered in many Air Force circles as being too sympathetic to the Corps of Engineers. But I don't think there's any particular reason to complain any more about the Air Force than I have done elsewhere.

Q: What about the Corps' relations with the foreign governments involved?

A: We had fairly good relations with the French, under the circumstances. But you must remember, we were in their country, their rules applied, and in our minds all of their rules included a lot of red tape--certifying and checking and so on--well, like we'd be apt to do if somebody else came here and occupied the middle of Alabama and was trying to build something! It's a natural reaction. There was a language difficulty, which was natural. Not only that, you had two languages. You had French and you had Arabic, which you had to work in.

Q: Did you have interpreters of your own?

A: We sure did. But on one occasion, I was visiting a radar site out in the boondocks. We were there, and we were trying to discuss it, and the contractor was actually a Moroccan. And the French were there, and it ended up with the Moroccan talking in Arabic to the Frenchman, and he'd talk in French to me, and I'd talk English to my people, and my French is not that good. But we managed--pointing to things on the drawing and using fingers and hands, we got by. But that's not quick. We found them arbitrary sometimes. In all of your real estate dealings, you definitely had to work through them, and you had to get their

approval for a lot of things, and it was hard not to feel that they were a delaying factor. But on the other hand, when you looked at it from their point of view, they were doing a good job of trying to get things done without destroying what they thought was their country's best interests.

We had problems with money and customs. In Dhahran, long after I left Morocco and was in the Chief's office as deputy chief, we finished up one aspect of the work on the airfield at Dhahran and tried to demobilize and send everybody home, and the Saudis kept a hostage. There was a captain who was assistant area engineer. They kept him and said they wouldn't let him leave until we had paid customs duties on the things that we had imported into Saudi Arabia to install in the structures the U.S. was giving them. After months had passed, the young man's mother became sick. He received an urgent request to come home, and the Saudis let him leave. I immediately put out instructions from the Chief's office never to let him back in Saudi Arabia.

We had some of the same kinds of problems in Morocco. We had a provo marshal, the Air Force had air police, the French had their police. And you had high livers, on a construction job like that you had people making big money. They weren't supposed to have scrip. Only government employees and the military were supposed to have scrip. The contractors' employees were supposed to be paid in francs in Morocco or dollars in a bank in the U.S. We had one occasion when my provo marshal broke up a card game and seized \$5,000 or \$6,000 worth of scrip as evidence. It was being used at a poker game where contractors' people were playing as well as people authorized scrip. So he impounded the scrip. Shortly thereafter the theater froze the old scrip and replaced it with a new issue. This was done every so often to combat black marketeering. The provo told me that this would keep him from having to try the guy because the money we were holding as evidence wouldn't be any good in a couple of days anyway. I had to make him turn the money in, certify it, put some other "in hold" until the trial could take place.

There were a lot of things like that. We had some undercover people too. We knew that the French had agents, and they were watching us all the time. You couldn't very well try to pull anything, which is just as well anyway. It was to our advantage to establish good relations. There isn't any point to fighting people if you can do it the other way. So we went out of our way to assure that they understood and sympathized and tried to help us accomplish what we needed. I'd say these aspects were similar to what I had tried to accomplish out in India in World War II. To get the job done you need a friendly family feeling in the place. What else would you like to ask?

Q: I think as far as Mediterranean Division is concerned, that's all.

A: Oh, let's see. There were a lot more things on disposing of surpluses. We made a strong effort to dispose of surpluses. There was a tremendous stockpile of lumber. It was pretty well sold, not at profit but not distress figures exactly. A lot of the equipment brought back money to the project. It was just moving it from one Air Force pocket to another but it gave our Moroccan project a better appearance.

The Navy was starting to build in Spain for the Air Force, and they couldn't get equipment to build with so they finally in desperation came to us. We reinstated or expanded the repair facilities of Atlas and let the Navy representatives pick out the particular pieces they wanted to acquire and stand there and tell us which parts they wanted replaced and all the rest of it. We rebuilt it for them. We got reimbursed for the cost of the rebuilding, and then we got a credit towards the project for what we shipped to them. I was careful to follow that because there was a good chance for us to stub our toes with the Navy if we sent them stuff that wasn't properly rebuilt. I went up there and called on them a few times and checked with them later and checked with the Washington level, and they assured me that the equipment they got from us in Morocco for use in Spain was by far the best they acquired, other than directly from the manufacturer. So that was one thing.

There were a lot of camp facilities for the contractor. You had generators, and kitchens, and things like that, and we ultimately turned those into line item facilities, either as they were or took the equipment out and refurbished it and put it back into the process, thereby recovering it. We recovered or put to permanent project use close to \$15 million worth that we couldn't account for shortly after I got to Morocco at the time of conversion. And within two years we had wiped that out. We had found, properly used, and taken credit for, or sold, shipped, and whatever--rebuilt the \$15 million that we couldn't account for in 1953--and were back on an even keel. So all that got distributed into the savings of a place like Boulhaut, too.

Q: That must have pleased the congressional investigators.

A: Oh, by that time they weren't too concerned. Yes, it pleased a lot of people including us. It should have pleased them, and I'm sure it did. But I do not remember Congress taking any note of the achievement. They had made their points in 1952-1953 and considered their work completed.

Q: You have pointed out elsewhere that you didn't think the Corps got good coverage.

A: Oh, yes, that's right. I don't think they did, and they may not want it now, I don't know.

All right, now we worked with JCA [the Joint Construction Agency] in Paris. One thing we did, we transferred TUSEG to them while I was still Division Engineer. It's transferred a few times since then, too.

Q: Now why was that?

A: Well, you got NATO more directly involved out there, and MED Division was off to the flank. Then when the MED Division moved up into Italy, it became more closely related again. Of course, we subsequently added work in Iran, Pakistan, and Afghanistan to MED Division, too, while I was deputy chief. The big program in Saudi Arabia now is being financed with their own money. It is a

remarkable program, building for the Saudis with their own money, that started back 10 or 15 years ago in the TV business. We had a big program to put in TV facilities over there with their money, which is a sign at least that they must think you are trying to do the right thing. Okay, are you ready to leave that part of the world?

Q: And move you back to Washington.

A: No I go to Fort Leonard Wood first. In the summer of '55, I was ordered to Fort Leonard Wood, Missouri, to take command of the 18th Engineer Brigade, which is a troop unit. This was good for me. It was ten years since World War II, and I had hardly been near a soldier. But I also began to ask myself: Do I know what units are like these days? Do I know what the organization is like? Can I identify the insignia? As a company commander in the 3d Engineers, my new battalion commander had arrived after having been on District duty from World War II until 1939. And he had to get me aside and say, "What are these different insignia?" I thought, boy, that's never going to happen to me, and here suddenly it was!

So I asked the Chief's office for permission to come back through Europe and England and visit some of the Engineer units and see what they were doing and get a better concept of things so I could do a better job when I got to Leonard Wood. And again, that's kind of intellectual curiosity, but it was in my direct interest. So I was allowed to take my family. We flew from Morocco to Germany. They went sightseeing while I traveled in Germany and visited different construction units and talked with staff engineers. Then we took the boat train from Holland to England and visited some of the Engineer units with the Air Force who were building fields around England. We spent about three weeks in England traveling in and out of London and then headed for home on the United States, reporting to Fort Leonard Wood in August 1955.

Fort Leonard Wood was a chance to get back into the military side. It was a very unsettled business. The units weren't too well filled, and they weren't in top shape either. The war in Korea was over and the pressures were off. So I was able to work into it again fairly easily.

Q: How different did you find the troops when you finally got back to them?

A: Oh there wasn't as much difference as you might think. But there was new equipment in their hands, and they could do some things better. There was some difference in organization that I had noted on my trip home. The troops were better educated. The last time I had really been with troops, except in World War II, was back in the 3d Engineers. In those days you had a few high school graduates but not many. We had considerably more in this draft Army, which was fine, but also it meant you had to be careful to see to it you kept them busy and interested so they didn't go off half-cocked. Leonard Wood was not heaven but as far as I was concerned it was an ideal place to train Engineer construction troops.

Q: Why was that?

A: Because you could go out and build a road around the border of the reservation. And you had gravel pits, and water, and a lot of terrain, things that were needed and would be useful in training. While I was there they had one of these Louisiana maneuvers, and I learned about race problems.

I had a battalion that had been working up in Wisconsin during the summer at Camp McCoy. They had done a very good job. And they came back, stayed about three weeks or so, and then took off for the maneuver area down in Louisiana. But I didn't keep a close enough tab on things because after they were on the way down there by train, I checked and found that their fillers had come in, and they were about 50 percent black now headed for Louisiana. And I thought oh, oh, so I immediately sent word ahead to look out. And I gave instructions to my personnel people to ship them an overabundance of white replacements at the first chance and get the ratio down to about a third. I thought you could live with it without too much trouble with about a third. Well, before we could get more fillers to Louisiana, there was some trouble.

Q. What kind of trouble?

A: Oh with the troops. They would get into too many fights and fracases. No murders or anything like that, but not what you would want to have.

Q: Was there a problem of interaction with the local people?

A: I don't know that there was any because I wasn't down there. I don't know for sure.

Q: Then your fears were mainly internal?

A: Well, yes, plus the civilian. You get too large a proportion and you get gang effects. It has gotten better since then but still, 15 percent is a good number. You can do that and get along pretty darn well, but you go up to 30 and you're getting close to the trouble area. You get up to 50 or more and it's just like integrating a school. You can handle 15 percent with no problem, but you get up to 75 percent and bingo it goes to 90 in a hurry! Of course, it's too bad but it's a fact of life.'

At Fort Leonard Wood, I renewed many experiences and I took part in a map maneuver exercise up in the Fifth Army in the Chicago area, so that I felt more confidence again on the military side. But I only stayed about eight months when I suddenly was ordered to the Chief's office as assistant chief of engineers for military construction.

Q: Was this a sudden development, a vacancy or something? Didn't you expect to be at Leonard Wood longer?

A: Oh, I expected to be at Leonard Wood a couple of years. But I replaced Dave Tulley.¹⁰⁵ I wanted to stay but I'm sure my family were [sic] happy to move. Well, I'll put it this way, from the Chief's office viewpoint, with Dave Tulley moving on for some reason--I don't remember the reason--I would think I was the logical one to bring in with Morocco still going on and military construction, and I sure was experienced in that side.¹⁰⁶ It would be a logical move, I can understand it. As a matter of fact, I got purified in that eight months as far as not being near troops, so that was accomplished at any rate. I was the deputy post commander, incidentally. Now, again I'm back to

being a brigadier general at this stage too. In Atlanta before I went to Morocco I got promoted to brigadier general, so that would have been in '53. I must have been on the promotion list when Sturgis told me I was going to Morocco.

Well, one thing, I waited 26 years before I was really stationed in Washington: Of course, I had been stationed close at Fort Belvoir when it was Fort Humphreys, but I also waited until I was entitled to have a car to take me around the big city and also until I was entitled to have a parking space right by my office! And all of these things were very useful. I moved into military construction, and it wasn't too hard to do because many of the people in there had been working with me in Morocco one way or another, supervising me, needling me, or helping me, but I knew a lot of them.

Q: Was it something like your going from Mobile to Atlanta in terms of experiences?

A: To some extent. I had seen them at work. I had been back two or three times and days on end fighting for things and getting to know them. So it was easy to move in as assistant chief for military construction without any great problem.

When I got there I found to my sorrow that Sam Sturgis, the Chief of Engineers, was definitely in bad shape. He was ill. He wasn't effective at the office very often. In fact, I hardly saw him. It made me sad because I saw him so little as assistant chief. I had thought I would go in and talk with him about my job. I'd seen him during the war. I had called on him out in the Philippines. He was Sixth Army Engineer, and I enjoyed talking with him and finding out how they did things. But he now had Parkinson's disease and it showed up particularly when he went up to the Army War College to give a talk and just about collapsed in the middle of it and they had to get him off. So it was obvious something had to happen.

General Itschner was made Chief of Engineers--he had been assistant chief for civil works--and to my shock. he announced to me that I was going to be deputy chief of engineers for construction, which shook me no end. I hadn't expected anything like that.

Q: I recall in listening to the brief interview you had in Washington that you said that you were not sure why you were chosen, and you said about yourself and Itschner, "We're different." Would you like to elaborate on that?

A: Okay. I was deputy chief of engineers on November 27 1956, and was promoted to major general on March 25, 1957. I was surprised because I had known Em Itschner for some time, but not very intimately. I felt that he and I often approached things quite differently. I knew he was brilliant, but I was just shocked to be selected one of his two deputies. But there I was.

Q: What kind of differing approach do you think you had? This is important because in 1961 you would succeed him as Chief of Engineers.

A: Let me put it to you as I said in some of these other articles. Em Itschner was a workaholic. It used to bother me to see the amount of work he took home every night, and I used to try and soften that load so he wouldn't get swamped. One day I succeeded on a Friday in getting it so he didn't have anything on his desk. I was real proud of myself. I put a lot of stuff in the drawer of my desk that I would just let flow to him the next week. He wandered into my office along about quitting time with the longest face I ever saw. He said, 'I don't know what's happened, but I don't have anything to do this weekend.' I said, "Can't you get out and play a little tennis, or a little golf?" "Yeah, I can do that but I like to work on something." "You mean you're unhappy because you don't have any papers to carry home?" "Yeah." I said, "Go sit back at your desk for just a few minutes/' I came in with a stack several inches deep, and he was very happy! This is serious. He liked to read everything in detail himself. Me, I'd stay at the Chief's office until one or two o'clock in the morning on occasions to clean my desk off, but I did not carry anything home, and I would not carry anything home. If I felt that it had to be done, I'd stay there and get it done, and eat or not eat when I got home. But that was one difference.

We were also different in that he went into great detail on things, and I didn't think I very often went into great detail. Maybe I'm wrong,. but at any rate it was a different approach to things.

Q: What about the different parts of the Corps' work? Right at this point when he became Chief he went from civil works and you were in military. It's said that he favored one and you the other.

A: Em never did like the military end. He got a poor impression of the people in military construction when he was working in there right after World War II And he continued that impression. It ended up with me devoting a lot of effort to protecting the military construction organization during his regime as Chief.

Q: Protecting it from what?

A: From the Chief of Engineers. Some of the best people up in military construction never could say the right thing in front of the Chief of Engineers. Some of them--one or two--Harry Zackerson was a fine guy, pretty sharp and all that. but he was brusque, matter-of-fact, and if he had an idea he said it, zoom! He just rubbed Em Itschner the wrong way every time he got in the same room with him.

Q: Did you have a feeling that the military side of OCE was going to be cut back or anything like that?

A: No, I'm just talking about in the daily life. He wasn't going to try to emasculate it or anything, but he didn't have confidence in them.

Q: And you wanted to change that?

A: Well, if you work for a long time in that kind of a situation and realize your head knocker doesn't have any confidence in you it doesn't help your morale or your output.

Q: Do you think you succeeded?

A: Oh, I think I softened the blow considerably. There was another thing that bothered me. Em said, "Who should I put into your position in military

construction?" And I talked with him and he finally said, "What about so-and-so?"'

Q: Which position would this be?

A: Assistant chief for military construction. "What about Eddie Brown?" Well, I said, "Em, Eddie Brown quit working just a little bit before World War II was over in the Philippines." He looked at me kind of funny, but I told him it was a fact, he didn't do any work. He thought he'd be a good assistant chief for military construction, and I said, "I think he'd be the worst assistant chief you could put in there." Well, he said, "I'm sorry, I'm going to put him." So he put him, and I helped struggle to try and keep him out of trouble, not too successfully.

Q: There were others you would rather have seen?

A: I would rather have seen several in preference to Eddie Brown. But don't get me wrong. Eddie is a friend of mine, and I like him.

Q: Well, that must not have helped morale when you couldn't get the one you wanted.

A: No, it didn't help. And then I had a classmate who was an outstanding expert in military construction but I didn't think belonged as assistant chief because he was too much involved in detail. In both cases I recommended against them. In both cases Em went ahead and put them in there, and both times within a matter of two or three months he was back to see me wanting to know what he could do about moving them. He just didn't like the way it was operating. I'm not saying that critically of Em Itschner. I think he probably had a bear by the tail. I think Eddie Brown had not satisfied somebody in the Pentagon in his previous position. He was in the TLO [Technical Liaison Office] over in the Pentagon.

Q: And they wanted him out of that position?

A: I think they wanted him out of that position, and so Em *was putting him in the first position that came along, but he didn't tell me that. We actually worked together very well because I made

it my point to find out what his views were on things, and then from then on that was my view except in discussions with him. Em and I got along fine. I told him frankly what I thought, but after I told him and he made his decision, that was it as far as I was concerned. I didn't hesitate to speak up in opposition to what I knew he was about to come out with if I thought I ought to, but again I didn't carry it on past that occasion.

One of the officers, who later got to be a three-star general, was the executive officer in the Chief's office. He did his best to do just exactly what Em Itschner wanted, and I knew he did. So when it came time for the efficiency reports it was expected that I would rate him and Em would endorse him. But I told Em that the executive officer [Lieutenant General Carroll H. Dunn] and I crossed swords every now and then and if I gave an honest appraisal on an efficiency report it wouldn't help him, and I told Em I didn't think he wanted me to do that. So he said he'd do it, and the officer ultimately got to be a three-star general. I like him. I think he's good, but on that particular job I think he was looking after the interests of the Chief individually as opposed to the interests of the Corps, if you know what I mean. Really I have a high regard for this man and later handpicked him for one of the key jobs in the Corps. I just thought Em's rating would do him more good than mine at that time.

But again, Em and I got along fine. While he was away I went to the things he was supposed to go to and when he was in, I stayed away from them. I kept him informed of everything I thought he needed to know. Every now and then I tried to work around a little bit and soften some of his edicts. He had a hex [sic] against inspection boats. Well, I'm convinced that if the District Engineer has a means of getting out on the water in his District and seeing what's going on, he has a far better relationship with the towing industry than if he has no means of doing it. So I think it's part of the job that you ought to get out some on weekends: go around and say hello to folks and find out what they are thinking, where the trouble is in the channel and all this kind of business. But Em

just didn't agree with that. So he announced that he was going to get rid of all the inspection boats, which he did.

Then I went down to Norfolk and found there was one still there. It was a Transportation Corps boat transferred to the Corps of Engineers. It wasn't plush or anything. I said, "Look boys, if you want to keep this, don't show this to the Chief of Engineers. Put it in a back channel someplace anytime he comes to town." And it wasn't over three months before he came in one day and said, "Did you know they had an inspection boat down in the Norfolk District? They carefully got it out to give me a ride on it." I said, "I knew they had one, but I didn't know they carefully got it out for you to take a ride on. I'm sorry you found it. I thought it was useful. I guess it's gone now." And he said, "Yes, it's gone now."

Now this goes in surges. They're back in several Districts again. I don't know whether the Mobile District has one that's any good, but a lot of Districts do. We just had different personalities, but he chose me. I must have satisfied him because I became Chief of Engineers when he retired. Since he was on the board that recommended me, I'm sure he had something to do with the selection. But at the time I would never have thought he'd pick me to be his deputy.

Q: And what was your prior connection with him?

A: Oh, I'd been a District Engineer and I'd seen him as a Division Engineer. As I mentioned earlier, I had visited him in advance section in Belgium in February 1945, and I had seen him on several occasions while I was Division Engineer, SAD [South Atlantic Division]. I had seen very little of him when he was in military construction in OCE because I wasn't involved in military construction at that time. I saw him frequently in the Chief's office the six months I headed military construction, since he headed civil works.

Q: What major projects were you involved with as assistant chief for military construction? I realize it is hard to separate out some of the projects, as they continued while you were deputy chief and Chief.

A: I don't remember offhand what we were doing except that there was a good-sized worldwide construction program under way. There was still work going on in Morocco. There was a lot of work still going on in Korea. We had activities in the Philippines and all through the Pacific, in Okinawa and Japan, but I would have to cogitate to remember which specific projects were in the forefront during that six months in the summer of 1956.

I was also back again in the permafrost business: and snow, ice, and permafrost in my positions in OCE. I felt that I was seeing an old friend. We were trying to build a facility up at Dartmouth in Hanover to house the combined research staff. That finished up much later [1963].

Q: Since it overlapped, I thought we might discuss your involvement in the space program as a general question covering both your assignments as deputy chief and Chief. But perhaps you'd like to touch on your assignment as commander of the Engineer School at Fort Belvoir first.

A: It might be better to talk about Belvoir now, including the selection as Chief, and get it out of the way, and then we can go back.

I had completed over four years in the Chief's office as assistant chief for military construction and deputy for construction. That was a considerable period and, frankly, I was poohed out. It was a pretty drastic life, and going to Fort Belvoir from OCE was my idea of going to heaven. You weren't too far away from the action and you lived in beautiful Quarters One. It was fun going back to the academic world and supervising the Engineer School, and I looked forward to it. As far as I was concerned, that was to be my last assignment. I was going to go to Fort Belvoir, and then when the time came I was going to retire. In '61 I had 32 years' service, which was not too far from the routine retirement time. After a couple of years at Belvoir I'd be ready to retire and be real pleased with life. It was fun getting back to being with troops and with the school and trying to stir some things up, but it was a relatively simple life. The pressures were manageable, and I enjoyed it. I had a good staff.

One of the things that happened while I was there was the inauguration of President Jack Kennedy. That was a little out of the ordinary and did create some tensions. In the first place, we were instructed, about a month before the inauguration, that it was to be our responsibility to remove the heavy snow load on the inauguration parade route in D.C. if there was any at the time of the inauguration. That was reasonable, and the chief of staff, [Colonel] Harry Fisher, came in and said, "I presume in accordance with your normal instructions we'll assign this to the group." I said that if that's what he recommended it sounded fine to me. "Pass it on to the group. They'll be able to carry it out." I did not think too much about the task and it didn't look like it was going to snow.

But about three days before the inauguration Harry Fisher came in and said he just was informing me that the group was sending a lot of equipment to Washington. I wanted to know why and he reminded me of the snow mission. "But it's not going to snow," I said. He said, "General, when you came down here you told me you wanted our headquarters to assign missions to units and stand back and let them go--watch them, try to fill their requirements, and goose them a little, but it was their job. Do you want to change now?" I said, "No, Harry, you're right. I'm sorry. Leave them alone." They moved that equipment up there and the drivers returned to Belvoir.

The day before the inauguration, Secretary of the Army Brucker's farewell party was scheduled at Fort Myer.¹⁰⁷ I had known him pretty well as deputy, so Mrs. Wilson and I drove up in our car to the officers' club. Along about three-thirty or so, it started to snow. I suggested to Jeanne that we leave a little bit early so that we beat the Pentagon traffic and get down through that mixmaster on 95 and beat the traffic to Belvoir. However, the Pentagon was smarter than I and turned their workers loose early, and by the time we got to the mixmaster it was a pretty slow process. We got home about nine-thirty or ten o'clock and we'd left up there about three-thirty or quarter of four. Each time we had to stop on a hill we wondered if the car could get going again, and we

worried about the car getting overheated. Every now and then I'd look across on the northbound lanes and see a truckload of soldiers going by and I thought, "Wasn't I smart not to interfere with the group commander!" We got home pretty late and barely had gas left. I checked up and found. out the group units were in D.C. and they were moving snow. The next morning at the crack of dawn I went up there and inspected downtown Washington. It was just remarkable. The troops had cleaned those streets to where there wasn't anything to get anybody's feet wet. So I drove back to Belvoir and got Jeanne and we came up to watch the inauguration in a hotel window. It just went back to the good old command system--give a man a job and leave him alone.

Well, that was one of the unusual things at Belvoir. There were not too many more that I can think of offhand. It was a real fine life. My family loved it. We had three of our kids home. The fourth one had just graduated from the military academy in June of '60. That was about where things were rocking along when suddenly I was directed to come into D.C. and be interviewed. I wondered what was going on and it didn't take long to find out. I was sent to discuss some things with Senator Kerr, and then sent to the White House to discuss some things with President Kennedy.¹⁰⁸

Q: What did they ask you about?

A: They wanted to know what my attitudes were on various activities affecting the Corps.

Q: Do you remember what specific things they were interested in at that time? Were they the usual questions?

A: I don't know whether they were usual or not. Senator Kerr was very interested in knowing the extent to which I had been observant of the development of the Arkansas River and what I knew about it, whether I thought it was a good project and so on, whether I thought we could carry out our commitments. I was very easily able to satisfy him on that-because I did think so. I'd been working on it off and on as deputy and had fairly frequently visited the valley and inspected the

construction. I also told him about arranging to visit the Little Rock and Tulsa Districts when I was District Engineer in St. Paul. This impressed him.

Then I went to the White House. Jack Kennedy sat down and said, "Do you mind if I keep working on a speech? I must give it in 30 minutes." I said I didn't mind. So all the time that he was talking to me, the door would open and they'd bring in another sheet of paper, and he'd scratch it up and send it back. But he was very fine to talk with and he asked me general questions. He said, "Now, I realize that in your position you will get a lot of political pressures on you." I said, "There will be pressures applied, there's no question."

Well, he said, "I want you to know that you aren't going to get any pressures from me, and if you get any pressures from people who work for me that you don't think you ought to comply with or that you think you can't defend against, I want you to call me on the phone and tell me. I don't want any political pressures applied to you. Now, I want you to do what you think is right, but I also want instant response when I ask for something, whether it's favorable or unfavorable." I said, "Yes, sir, that's fine." And he said, "I want you to have a phone that connects with the White House for awhile, and we'll see." At that point I was pretty certain I would be the next Chief of Engineers, so I went home and told my wife not to tell a soul and just keep right on living like we have been living. And that's what we did.

Q: It sounded like he was talking to you as if you were already the next Chief of Engineers.

A: In essence he was. As a matter of interest, there were a couple of times that I got calls on that phone. Not too often, but the phone rang a couple of times, and I'd pick up the phone with trepidation and he'd say, "This is Jack." One of his calls was about a construction contract just about to be let for construction of a missile complex in upper New York State. He didn't understand why I had to turn to the West Coast for a contractor to build a missile complex in New York State. I said, "Well, sir, we don't have to, but

we do have to take competitive bids and we are attempting to be sure that we have well-qualified contractors by screening them in advance and deciding who will be permitted to submit bids. We have procured good contractors that way. In this particular case it might interest you to know that the contractor that's the sponsor for the combine to build this job is headquartered in New York City, although some of the combine are from the West Coast." "Well," he said, "I don't know why I'm bothering you then." I said, "You're not bothering me, sir, but I would have had to tell you the same thing even if the sponsor was from San Francisco." And he said, "I can understand that. I appreciate it. Thank you very much." That ended the discussion. It was one of the complexes we had the most trouble with thereafter. The contractor himself was a little bull-headed and wouldn't take any of our suggestions, and we could not get the Air Force to modify their requirements until many dollars had gone down the drain.

Q: You said earlier in another interview that some people came to you from the Hill and industry and urged you not to be overlooked in the selection of the next Chief of Engineers.

A: They wanted to know whether they could work for my selection.

Q: Do you remember who they were?

A: At this late time I had better not try and point them out--17 years is a long time to be certain of details--but there were some people from the Hill who said I was their candidate. And there were people in industry.

Q: Why were you their candidate?

A: I suppose because I had lived in their part of the world, and they had known me and worked with me as opposed to somebody that had come from someplace else.

Q: In industry, do you mean contractors?

A: Yes. there were some contractors or people in the AE profession, people who were interested in

projects of the kind we handled. I said, "No, I'm not looking for the job and I don't want anybody trying to sell me for the job."

Q: Did they follow your wishes?

A: I don't know. As far as I know they did. I never had any indication otherwise. I knew who was runnin', and they were running hard. There was Joe Potter⁴⁰⁹ and Bob Fleming¹¹⁰ and Bill Carter and I don't know who else, but those in particular.

Q: And they were all from within?

A: They were all right around my time. Bill Carter was a year after me and Joe Potter and Bob Fleming a year before. They were all USMA a year either side of me. I knew Joe Potter and Bob Fleming were really stirring up things. Bob Fleming had the flood fights up in New England and made a big name for himself in that part of the world. There were a lot of senators from up there. Joe Potter had been the Mississippi River Commission chairman and in the Omaha area and had a big string of supporters. Bill Carter was well known on the Hill and in industry and was serving as governor of the Canal Zone. I thought it was a cinch that I wasn't going to get it. I sure wasn't going to run for it anyway.

Four years later I found out more about how the Chief of Engineers is selected when I sat on the Army board to select my successor, Bill Cassidy.¹¹¹ How much influence politics is going to have on it, I didn't know and I still don't know. I guess it depends in each case on the situation. I do know that when Speck Wheeler was first planning to retire, the Army board didn't select Lew Pick to be one of the three recommendations. President Truman sent it back to the Army and said, "Where's Pick? Put him on the list and I'll accept it." So Speck Wheeler was talked into serving another year because everyone figured that Truman would get defeated in the next election. And sure enough Truman didn't get defeated. So Wheeler went ahead and retired and Pick became Chief of Engineers. I don't know, I wasn't on the board. I guess that was a fait accompli. But I do know that the Army board that

selected three names to recommend as my successor had Bill Cassidy as number one on the list.

Is there any more on that era that we're looking for?

Q: From the selection? No, I think that's it.

A: Now, where are we now? We were going to talk about the missile program.

Q: Two major programs that were important during your term as deputy and Chief were CEBMCO [Corps of Engineers Ballistic Missile Construction Office] and the space program, including the facilities at Cape Canaveral and Houston. You have discussed these programs before, but I would be particularly interested in your evaluation of the Corps' contributions to these programs and the biggest engineering challenges that were involved, as well as anything else of significance that occurs to you.

A: Okay. Well you might say I was lucky to have been in the Mobile District when we got introduced to that business back in the 1950s era with von Braun. So I did have a start knowing something about it. First, as assistant chief for military construction I became involved again in some work we were doing in the line of missile support for both the Army and Air Force. Most of my period as deputy chief was wrapped closely around the missile program, particularly for the Air Force. And during my term as Chief, as the Air Force programs began to reach completion, our emphasis on space construction shifted to support of the NASA programs.

They were tremendous. They raised more than what you could call challenges. They were pretty rugged. They had the usual urgency, the necessity to get things done. There was always in the background the obvious feeling on the part of many people in the Air Force and NASA, why did they have to fool with this bunch of Engineers from the Army, why couldn't they be doing all this themselves? It's a good question, but it had been set up all along in the military that we shouldn't duplicate. We would have a strong organization and it would support both the Army and Air Force programs.

Thinking back on it, I still think it was the right approach and I'm glad we did it because we could throw overall support from all our activities into it as I mentioned we had done earlier in the Korean fracas, and we did.

But this thing ballooned very fast. As usual, and this is not said to be critical of the Air Force because there was no way for them to know what they really wanted, the state of the art hadn't reached the point of knowing what you wanted sufficiently to put out reputable plans and turn it over to a contractor and say, "Now, go out and procure and hire people and build this thing." That just wasn't in the cards. It could have been if you'd add a willingness to accept four or five more years' delay in the ultimate completion, but at that stage in life there was a definite feeling that this had to go fast.

We tried to find a way to organize and overcome some of the problems. It was obvious that we didn't want every District in the United States developing the capability to work on building these missiles. It was also obvious that, and rightfully so, the Air Force was going to control the design and hire the architect-engineers for most of their programs. Likewise since they would control design of the vehicles, NASA would participate extensively in design of the earth structures to service them. There would be some peripheral things that we would have to do. We needed to have an office with authority to act, that could work directly with the Air Force, the portion of the Air Force that was doing the design work and knew the most about what they wanted.

We did not want to set up a completely independent construction agency, however, ignoring the capabilities we had scattered around the country. And we had to try and find some way to pull it together. Obviously, since Air Force work was centered in the Los Angeles area, the Los Angeles District became a critical factor. We tried to operate it by setting up a special organization within the Los Angeles District to be the point of contact on that program. Ultimately- it became known as CEBMCO, the Corps of Engineers Ballistic Missile Construction Office, but it started off

with other lesser names and with lesser authorities. I think they did a pretty good job. Colonel Tom Hayes, as I remember it, was really the first head of that organization and stayed with it for quite awhile.¹¹²

He did a good job of coordinating everything, but there were lots of jealousies to be overcome, too. The Air Force had it, the architect-engineers that the Air Force hired had their own, probably we had some also, and so it wasn't all sweetness and light, let's all get together and get through with this thing in the best possible means.

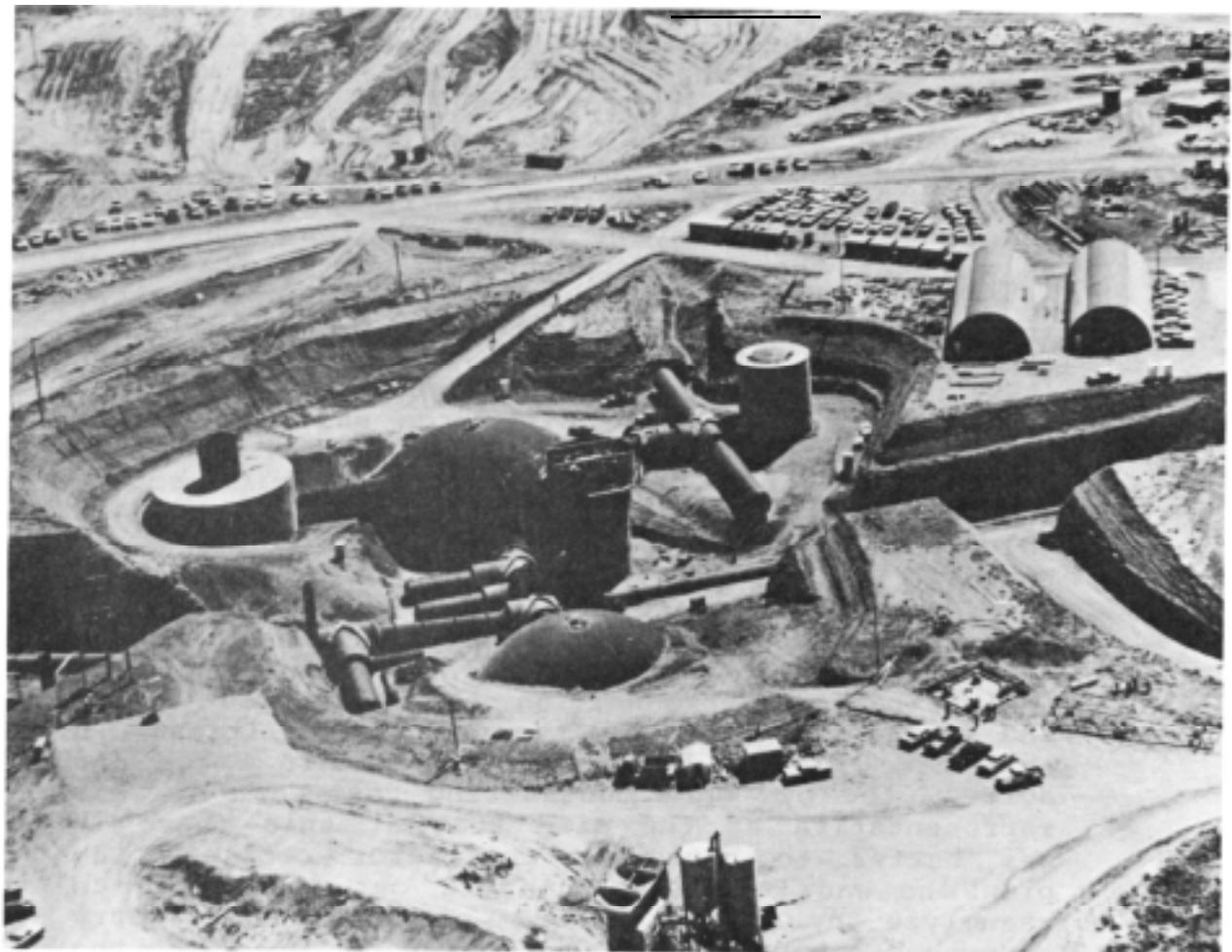
It was rather obvious we were going to have to get into the cost-plus-fixed-fee procedures again if we weren't careful, but we wanted desperately to avoid that if possible because we had seen what happens in CPFF construction. so we tried to come up with some form of unit-price or lump-sum contracts in which, however, the terms would be somewhat vague and need to be flexible because you couldn't know exactly what was to be built. But in all honesty, at the start we didn't realize what extreme problems this would run into also.

I think I'll just diverge a second and talk about that in more detail. The part of the Air Force that was supervising the design *of the silos, for instance, and the general layout of each one of these complexes had a pretty good knowledge of what the widget or vehicle that fired was going to be like. But when they changed one little item on that vehicle that was going up in the air, it changed the requirements for the silo and the connections in the silo and the size of the silo. But again, they never had even tested these vehicles or silos. They were still a dream being drawn on paper. And so as you got into it, there were more and more changes coming on, just rolling on, rolling on, rolling on, and each time there was a little change in the configuration or method of operating the missile itself, or its silo or gun, there was a resultant change in the physical things put there in the silo to send it off.

Now, as an example, on some of the earlier contracts for missile complexes the instructions, advertisements, and specifications would be a stack

about six or eight inches thick, but within six months or so it would have grown to four feet thick. It was just a terrific job to try and keep up with it. The Air Force would say I "You're delaying. You are not moving fast enough. Why haven't you gotten going with this? Why don't you make the contractor do that? This is just a little change, why do you get so excited about it? This shouldn't be very expensive." Well, we all had to learn because, for instance, you change something in the lower end of a missile where it connected on to some firing mechanism or something else in the bottom of the silo. Okay, you don't know where it's going to be, they just say, "Sorry, we are going to move it a little bit." So what do you do? Do you stop work? No, you don't stop work. You block out, you leave a place blank. That doesn't sound too bad, and it's not too bad. But you go along and it may be six months, nine months, before that's all designed and you begin to construct this small detail. By that time the silo's now come up out of the ground and is a terrific confusion of wiring and tubes, and fuel loaders and everything wrapped around it, so when you finally get around to putting in let's say, one cubic yard of concrete that you left out, it's going to cost you \$10,000 for that one because of the difficulties of getting back down in the bottom of that hole and the number of people required.

The other thing was that it was extremely complicated and each prime contractor needed many subcontractors: you had mechanical subs, electrical subs, fuel subs. You also had a very great requirement for cleanliness. You couldn't have a little dot of carbon in something or it might explode the whole silo or complex. So in certain portions of the work you had an extreme cleanliness as though it were in an operating room in a hospital. All of this gradually soaked into us, and to the Air Force. We were quicker to recognize the added cost. The Air Force didn't want to recognize the added cost because they had to go back and justify it, a requirement for more money. So their natural reaction was well, we'll just hold back on that contractor. He's making a killing. How could he use all those people?



Titan I Site construction.

Okay, I went into a silo up at Denver. It was one of the early ones, it was underground and there were several--well, it was a complex, everything underground--so you had a tunnel over here going to one and one over here going to another, and so on. And each trade and each contractor had his own color on the hardhats so he could figure out where his people were. And there were more people in that damn hole than could be accommodated. But remember they were all under extreme pressure to make their deadlines, each individual subcontractor as well as the prime. And then, to my horror, I discovered that we had a subcontractor going along installing electrical wiring in the tunnel and about 50 feet behind him came another crew removing it, and it turned out they were an Air Force installation crew. The Air Force said that final hookup and installation would be theirs, and they or their vehicle prime contractors would employ subs to do this final modification and hookup. And we agreed since it seemed preferable for the Air Force to control these final crews than for them to step in at this stage and try to direct in detail the activities of our prime and subcontractors who had been dealing exclusively with our contract administration personnel on the so-called "brick and mortar" contract for the ground facilities. In this case it was determined by the Air Force and agreed to by our contracting officer or his representative at the site that at this phase it was better to have our contractor complete the plans he was following than for our contractor to reanalyze the job as a result of this change, carry through to acquaint subs and workmen with the change, and then negotiate the change with the Corps even though this meant that the Air Force installation sub would be taking out something we had just put in.

Well, that's just a little sample. It was almost impossible for any one person, including the president of our contracting firm or the Air Force or anybody else, to really know what he was looking at, or what people were doing. We had to get things put together and start trying to make systems work before you could be sure.

Q: The basic problem, then, was that design was going on at the same time as construction?

A: It was definitely build and design, yes, very definitely. And the problem was the extent and the state of the art. They had good and sufficient reasons, for changing the diameter of one of those things maybe a little bit. Well, that can change the size of your gun barrel, which is what the silo really is. And they were testing these all the time, too, remember. They were firing these off at Vandenburg or down at the Cape or testing them up at Huntsville on the engines. All this kind of business was going on simultaneously.

Q: And new test results might necessitate changes?

A: Nearly every test would call for a change.' It got clear out of hand. Now the contractors were worried because here they were going ahead and cranking the work along and seeing dollars go down the drain because of overtime and extra people around, and they felt like they could do it more efficiently if they could just be given more leeway on the completion or phased timing. We often sympathized with them. We tried and brought that up with the Air Force time and again, but it couldn't be. They had enough backing to say, "No you can't change that. We are committed." They were the ones responsible, so it was a pretty tough proposition. We had several contractors start getting in trouble financially.

One example was the prime contractor of the Omaha missile complex. I hadn't been real happy with that particular combine when they first submitted their bid, but they made bond. They were on our list of qualified people, and I couldn't figure any way to throw them out. Sure enough, they were the first ones to have trouble. But don't get me wrong. All the contractors, the finest contractors in the United States, which means the finest contractors in the world, were in trouble in this thing inside of a year. And the costs: And you get back again to somebody saying, "Well, you only have to put two or three yards of concrete in there or you only have to put a mile of wire in that thing, it can't cost that much money:" Well, no it can't, but it does! If it had been coming along, all the plans had been there, you could lay them out and plan everything, integrate your effort with the different subcontractors, go through and have

no changes, oh man, it could have been an entirely different thing.

Q: Was there a similar experience in the space program in regard to project changes?

A: Yes, but we'll come to that. We had learned something. It came along later. It had the benefit of a learning period, if you want to call it that. We developed some new words in the contracting business. There was the "learning curve," that was one. Of course, that's not too new a word, but it was suddenly a very important word. There was "acceleration, cost of acceleration." What does it mean? It just means it costs more. Well, how do you define it? Well, you don't define it. It's just going to cost more and you're going to have more costs that you can't pinpoint the reason for. But it's going to be there. Nobody's putting the money in their pocket. It's just tough. There were words like this. What was the word we used for design as you go along? 'Concurrent design and construction.' It got to be too big a problem.

The Air Force said our outfit out in Los Angeles, the Los Angeles Missile Construction Office, didn't have enough power and authority. They said the Districts that we had involved were doing the building and had too much power. The Air Force said they needed to make changes in the design, and it took too long to get the word to the various sites of construction in the several Districts. We finally accepted the fact that what we had set up was a good way of doing things more or less normally, but there had to be quicker response in this program and there had to be quicker coordination. There would be delays but we wanted to eliminate our own delays.

Now, again, this was not by any means the Corps' problem alone. It was the Air Force's problem also. The Air Force couldn't get themselves to make decisions. I mean they'd see that they would have to change a particular feature, but they couldn't get the gears meshing to say stop. And we'd go on down the road for a month or two and then finally get the order to stop. Then you'd have to tear more out. The Air Force solution was

to station a man 'at each site with complete authority, the hell with contracting officer requirements and everything else. This man was to be able to say, "do this" or "do that" and everybody would have to jump. Well, from their viewpoint this looked like a fairly good deal, but from the administration of the construction contract in the millions of dollars it was a rugged operation.

So that's when we modified our organization and took this ballistic missile construction office out of the Los Angeles District and used it as a nucleus to set up CEBMCO in Los Angeles reporting directly to OCE. We picked Al Welling to run it, and we all analyzed it and he analyzed it, and he said that he wanted to divide it into missile types or families. So we had three principal assistants to Al. One running the Minuteman, one running Atlas, and one running Titan. They were completely different kinds of missiles with different fuel requirements, different types of support facilities, etc. So we gave him authority to set it up.

Q: What was Welling's background?

A: .Oh, he had an extensive background in management of construction. He'd been the deputy theater engineer in the India-Burma theater, top assistant to Tom Farrell, and when Farrell went home, Welling became the theater engineer. He'd had the Baltimore District, and he had been engineer commissioner for the District of Columbia and was knowledgeable. And he was the kind of personality I thought that we needed out there. He was somebody who was going to go boom, boom, boom! We'd had a nice-guy type for awhile and now we had to go to the other extreme.

I knew he'd have to stand up and occasionally fight with the Air Force. He was going to be under all kinds of pressures. He set it up with the three deputies. We handpicked three people to be his principal assistants, and they were good. However, under the pressures one of them broke and had to be replaced later down the road. But these three each had complete contracting authority, almost everything. Welling had to retain just a little

bit. As far as the Chief's office was concerned, we gave them pretty much of a free hand. What we were there for now was just to support them and help them and defend them and try to keep a lot of this trouble off of their backs if we could.

Q: So it was another example of decentralization?

A: Well, it was decentralization of approvals and authorities and so on, but it was centralization of control of the missile program itself into that one area. The Air Force had an adjoining headquarters right in the same building, and so these were put together. The Air Force put an officer at each of these major missile complexes, and they gave him a title of some kind to indicate he was the kingpin. We had our resident project officer, whatever you want to call him, at each of these same complexes, and we gave him additional authority. But we had to alert him to the fact that we were building the same type complexes in several other areas, and when we turned all of them over to the Air Force they had to be essentially the same or the Air Force was really going to be unhappy if they had to train operating crews for idiosyncrasies at each site.

So these area engineers had to recognize that they couldn't take instructions from the onsite Air Force king without clearing them through CEBMCO in order for CEBMCO to say to the Air Force if appropriate, "Look, we have to keep these complexes comparable. Now what do you really want?" This frequently brought Al Welling head on into the fray with some of the Air Force types. The Air Force had some smart people in this program and of course their systems contractors and designers supported their views normally, so in their viewpoint anything that was going wrong at the complex was the fault of the construction contractor and the Corps. And from our viewpoint we would say, "If you had only come out with the design in time and hadn't changed it every minute, just think what a nice construction job we could have provided."

Many of the construction contractors were getting in financial problems because the processing of a change order was such that our field office and the Air Force king on the spot would have to agree on

the intent of the change order, our people would then have to price it and negotiate price with the Construction contractor, but the Air Force king would have to say, "Yes, I think it's about right," which he wouldn't do. So here would come two separate stories into Los Angeles on everything.

The Air Force saying, "Bell, they're just throwing this money away. They don't know what to do. They don't even know what it's going to cost." And ours saying just the opposite: And then the change orders would stack up, and who was to make the decision? The Air Force had to get the money. The contracting officer could say to the contractor, "Okay, I'll award you that much," but unless he had money to back it up, it didn't do any good. And the Air Force had their problems procuring the additional money. so the situation got pretty tough.

Q: The contractors couldn't get paid?

A: On most of these changes they couldn't get paid until you had a signature on the dotted line. They weren't willing to sign for many of the changes that we, as well as the Air Force, wanted them to sign for on the basis of what we could sit down and analyze and come up with as a dollar figure. But it dawned on us slowly that you weren't ever going to be able to justify an exact dollar figure. You might do it ten years later when you went back and studied after the fact. As is always true, you could do better then. But we weren't ever going to get to a point where we could be absolutely certain of cost and state this is what the contractor's entitled to.

So with the assistance of legal branch in the Chief's office, Manny Seltzer and I worked on the problem hard with military construction and CEBMCO. We finally designed some new principles and concepts and got with CEBMCO and told them what we thought they ought to try and do and whether we thought we were being rooked or not. If we didn't break the logjam the whole program was going to go down the drain. So the Chief's office more or less put its neck on the line and said, "You're authorized to do these things, now do them!" And it took a devil of a lot of negotiation.

Again, just like I told you earlier about the dental excavation down at Jim Woodruff Dam, the contractors and their negotiators were honest, sincere people. It was hard for our own people to go out on a limb and recommend approval of some of the costs that were going to have to be approved if the contractor was going to go ahead freely. You might say we should cancel the contract. Oh boy, we tried in some cases, but basically it's too late if you want to make the deadlines. You've got to beef the contractor up and get him moving, and changing horses in midstream in that kind of a situation would really be something.

So over a period of several years, we paid more than we ourselves could clearly see and justify, yet less than the contractors could show it had cost them. Then you are back practically on a cost plus fixed fee. Yes, you are, no question about it, but at that stage in life we're too late to even do that. So we just had to make what settlements could be made.

While this was going on the Air Force picked their opportunity to attack. Curtis LeMay cut loose as Chief of Staff of the Air Force. At the Washington level we had a rugged time for awhile. As I remember it, it all took place when the Chief of Engineers, General Itschner, my boss, was out of the country on an overseas inspection trip. So as deputy I suddenly was the acting Chief of Engineers for all this controversy. I was constantly explaining to the Chief of Staff of the Army, or DCSLOG [Deputy Chief of Staff, Logistics], or the Chief of Staff of the Air Force, or the Secretary of the Air Force, or Secretary of Defense how we got into some of these binds and why we must have that much more money, and why we should not give up and turn it all over to the Air Force.

As a matter of fact, for about two weeks I briefed some crowd in the Pentagon almost every morning. And each time you had to put it in a different slant because it was a different group, different objections, different goals, and I couldn't have made the grade if it hadn't been for our Strategic [Planning] Group at the Army Map Service.¹¹³ Colonel John C. H. Lee was running the group, and he and I would be there 8, 9, 10, 11 o'clock at

night trying to figure out what can we say, what do we need data on, where do we go, what are we going to say tomorrow morning? And he would get on the phone after we had reached some conclusions and call the Army Map Service, and then he'd say, "We'll have them ready." On one occasion, I started talking in the Pentagon at let's say eight thirty, and the charts hadn't arrived yet. But I started talking, and as I got to a point I said, "Now on the first chart," and the first chart would come, and I went through that whole thing without knowing whether the charts were there or not.

Q: Was it just a question of the money that was being spent on the missile program or was it also a question of whether the Corps should be doing the construction?

A: That's right, it was the whole thing all wrapped together. The Air Force military thought this was their opportunity to get the Corps out of their business.

Q: Why?

A: Well, because they thought they had a good case here for saying, "This program must be concentrated under one head." And they did have a good case.

Q: When was this?

A: Offhand I don't remember It was probably July of 1960. This went on every day for about two weeks. The first time we'd be over at DCSLOG, let's say, and we'd try and get their support. Somewhat reluctantly they might give it. And the next time it would have to be up to the vice chief of staff of the Army and then it would go the next day to the Army Chief of Staff and then go to the Secretary of the Army and then the next day we'd start to work up through the Air Force channels, working our way up to DOD level. There were constant innuendoes being given to Congress all this time, and we were constantly in the process of responding and giving the Secretaries an answer that made sense and could be backed up. So it was not a very happy time.

Q: Meanwhile construction was going on.

A: Meanwhile the construction was going on, but the changes in plans were going on too. And we were getting pleas from contractors and, of course, they were getting pressures from us and the Air Force not to ask for any more money. But the price kept mounting and mounting. We really hadn't yet gotten real control of it. We were still negotiating and refining and pricing change orders two or three years after we had started on some of them.

As the later generation Minuteman reached the construction stage, improvement in the process of administration of the contract could be seen. The command setup that had been worked out seemed to be shaking down. Most of the senior people involved on both sides had begun to see how they could work better together and to appreciate the other man's problem. Our people began to realize that no matter how much we say, we need plans, and leave them alone, don't change them. It could not be helped because every day through the testing program something shows up that requires change. And on the other hand, the Air Force people began to see that there were costs in there that you can't quite see because of the complexity in a restricted area.

The work was underground on many of these complexes, and again, as I say, you walk around down there and see all these different-colored hard hats and ask yourself who's in control here? Well, not any one person really has control except that there is a general overall supervision and control. And again, the cleanliness requirements in the fueling areas were just out of this world. It was more than the kind of cleanliness requirements that you would need in a place where you were putting high-quality watches together. Truly everyone that worked in or entered these areas was required to wear a white apron or coveralls, with canvas covers over the shoes. We were informed that if one little dot of a contaminant--a dot smaller than could be made with a sharpened pencil--remained in the tank or piping or pump when certain fuels were introduced, there could be an explosion. That's hard to understand, but we had to accept it.

But to get back to the controversy in the Pentagon in July [1960], I don't know when the tide really turned. I think that at the end of that two weeks' period the Air Force had gotten tired of attacking and not winning. The questioning just gradually sloughed off and we went out of our way to give them more than they were demanding all the time. I think that just about says it. Actually, the missile construction program worked. It cost more money than it should have, but it didn't cost more money than it would cost again if you started under the same circumstances.

The secret again is to know in advance what you want--that has been learned in many, many fields--and make changes, but not too many. For instance, I learned that when I built this house we're sitting in here in Mobile. I didn't have much money. I wanted to stay within a certain figure that I could finance. My wife and I visited friends and looked at their houses and measured their different rooms that we liked and came to a point where we drew up a definitive plan that we thought was just what we wanted. But to play safe, I turned that over to a good architect to rework so that we wouldn't blame ourselves afterwards. But then the architect and I told my wife she could change anything she wanted right then, but once they started excavating the hole in the ground, she was not going to change anything.

This wasn't too easy, but it worked, and we started construction about the middle of January 1951. There was no rain for 30 days. We got the sheeting on the roof by then so that we lost no time *due to rain. In three months, we completed the house and were in it. That couldn't have happened, as the contractor said, if there had been major changes. And he added that we must have prevented at least a 25 percent increase in what would normally have been the cost. Oh, there were a couple of little things that didn't fit. Just as I walked out of the house a year-and-a-half later after picking my family up to move to Atlanta, I looked up under our bathroom where tile had been cracking for some time and I realized there was a cantilever beam stretching all the way from the back wall about 20 feet to the front. The reason it was cantilevered was because on one end it was sitting on top of the

door frame. No wonder we were getting movement upstairs. But, as I say, I didn't discover this until we were getting ready to get in the car and go. So my oldest son and I got a six-by-six and cut it a little longer than it looked like it would take. And with a sledgehammer we whacked that support in and closed the downstairs French door for awhile. It stayed that way until we returned at retirement. We had to design a new way to support the beam. That's why there is a little wall there. We moved the beam over.

My point is that I know that changes are far more expensive than work originally designed and carried out in the normal construction phase. Now, there was terrific pressure on the people that worked on this program. CEBMCO's management people were really under pressures. The Districts were unhappy as we took the management away from the individual Districts like the Omaha District and put it in the hands of CEBMCO. But we did our best to and succeeded in making use of the capabilities of the existing Districts in the area for many of the administrative requirements such as real estate, and auditing, and the like. We borrowed people from the local District for the CEBMCO field office in many cases and then gradually, as the work finally petered out, they moved back over to their original Districts.

So we got some of the best of two worlds. It was not what we had originally contemplated, and part of the reason you'll find later on down the road. Later programs come along like your missile program of today's era being managed by Huntsville. They have taken advantage of many of the lessons that we learned, and they still take support from local Districts. But, as I understand it, they control it out of Huntsville much as a separate Division; That's basically the same thing we ended up with. Is that enough on the missiles?

Q: Yes, I think so.

A: I might mention something interesting. As I say, I've been involved off and on in the missile business from 1950 until I retired and later, actually, and I have never seen one of these widgets take off from the ground. Every time I

have gone there--**and** it has been a number of times in places all around the United States--as I **got ready to** watch it take off something happened, and they have to postpone the operation. Usually I've said, "Well, I'll wait and see it another time." I've found out also that you can see a whole lot better on the TV or the movies than you can at **the** site. Finally, I got to the point where I said, "Don't schedule me there at a time when they are going to have an exercise because I'll jinx it." I went up to Tullahoma, which the Mobile District had been constructing for the Air Force-1 went up there as deputy chief or Chief, I've forgotten which--and they said, "Well, we can run you a test in our wind tunnel anyhow. That's for sure." so I said, "Fine." We went to look at the wind tunnel test and they lost their power! So I've never tried since.

Q: Shall we move on to discuss the space program and your involvement in it?

A: Yes, the space program followed along logically. After I became Chief it was obvious that there was **going to** be a space program, and I wanted to offer the services of the Corps to help **on the** construction if NASA was interested. I felt that with all we had learned in the missile business we ought to be able to help them no end. We had talent. We knew the industries that would do the work. I called up Senator Kerr and said, "Okay, now I want to come and ask you something." so I **went over to** see him and told him all this. And he said, "I have been thinking along the same lines. I wanted to find out **if you** would be willing to work with NASA. Now we don't want you to take over NASA.@" And I said, "We don't either."

Q: Was Senator Kerr one of the great friends of the Corps at that time?

A: Not necessarily the greatest but he was one of them. He was also the man who I believe had recommended [James E.] Webb as the administrator of NASA. So I said, "If you think it's worth it, are you willing to get me an appointment with Webb to discuss it?" He said **he'd** do more than that, he'd set it up and we would both be there. I don't remember the exact detail but we did get together

in Webb's office or the senator's office, I don't remember which. I was in the senator's office two or three times and in Webb's office a lot of times. He was just getting set up and the prospect of letting the Corps act as the agent for NASA on the construction side was brought up, and Webb said they had been thinking about it and they didn't know whether they wanted to or not. There were advantages both ways. And I said I could see that. There is a tremendous amount of talent that is available that could go on it instantly and there is some experience that has been learned the hard way that could be useful to you. As I remember it, it was just left that they were going to think about it and would be back with me. And before too long they were back with me.

Now, what all went on behind the scenes during that period I have no idea. But I believe we did sell the job on the basis that we had the talent: the organizations were intact and could be used. CEBMCO could pick right up on NASA work. As we had learned, we could make changes in our organization and procedures in order to fit their requirements. We had already been doing the work down at Canaveral that they took over. By we. I mean the Jacksonville District of the Corps. We had good connections with Huntsville through the Mobile District. Again von Braun shows up. I had asked Webb to check with von Braun to get his reaction, and I think probably he was one of the stronger supporters we had in NASA. At any rate, they accepted the concept of the Corps being NASA's construction agency under their overall management, and we started to set up the organization necessary to give them this support and to work out the usual arrangements for handling the funding, preparing the defense before Congress, and all this kind of business. But it was relatively easy.

Now they were in the same fix as the Air Force had been earlier. They were still designing [to] some extent while they were building, but to a much lesser extent than the missile program. Much of the state of the art had been developed under the missile program. So there were some of the same problems that had to be overcome or lived with or lived around in the space program as there had been in the missile [program] and that was natural. But

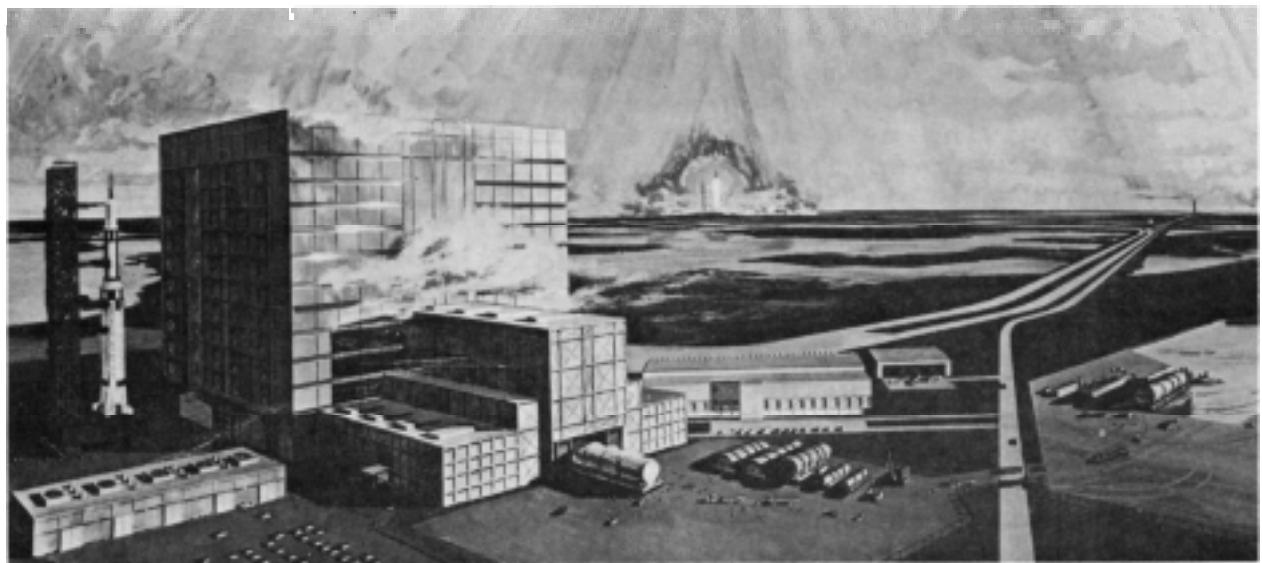
there wasn't nearly as massive a problem as there had been, and many of NASA's people and activities had learned from the missile program.

Everything that NASA did, however, was tremendous in size and scope. When we took on that big building down at Canaveral, they impressed it on me by giving me a ride in a helicopter. I was sitting way, way up in the air and the pilot says to me, "You are sitting on the roof of that new building, the missile assembly building." And I must admit that I was somewhat impressed.

Responsibility for the design work was split as you probably realize. For much of the physical brick and mortar business, we handled the design as well as the construction. The technical part of the design was strictly NASA's, and the construction was the usual team effort where our construction contractors would carry up to a certain point and then the air space operators would move in and finish it. We had far less problems fund-wise. There was some disappointment on the part of some of the working level in NASA that they weren't doing all the work. Here was that Corps of Engineers showing up again. But it was nothing to the extent that had gone on in the other system.

We put out a lot of effort. We put special assistants in several field activities. We did everything we could do to speed the program up. We put an officer over in the NASA office as our liaison with them. I went over there frequently, as did the top OCE people involved, and sat down with him and was briefed. We went out of our way to maintain an attitude of here we are, what is it you need, and tell us what you want and what the ground rules are and we'll get going. It was a tremendous program and it's really something. I still look at a full moon and say, "Well, I know they got there, but I don't believe it." It's really something!

Everything wasn't sweetness and light, but there were nowhere near the problems that came up in the missile program and for good reason. We had one problem that interestingly enough involved the foundations for that big building down at Canaveral. After the building was erected,



Vertical Assembly Building, Complex 39, Merritt Island, Florida.

somebody remembered that we had cut some piles off down there in a little cluster, and he wondered what happened. So they ran a little exploration hole down in there and discovered that the piles were cut off long before they reached the so-called rock. So then we had to design a truss to support the building in that area and tried to find out what had happened. And what had happened was real easy. We should have known better. The contractor was using a vibratory hammer and it was just doing fine, but at the end of a shift they shut it down. It wasn't until the next morning that another shift started working on it and by then the pilings were "frozen" in the sand and didn't move when they reapplied the pressure to them so they figured they were down to rock. Fortunately, as I say, one of our people down there got curious. It cost some money, but at least it didn't have any serious consequences to the program.

Q: How much of your time as Chief did you spend involved with this program?

A: Well, that first six or eight months or so, I spent quite a bit. But thereafter I didn't get bogged down in the thing. Webb was a good man to work with. We had a good friendly relationship. When I retired, he awarded me the NASA Medal for Leadership, which was real nice of him. I had a lot of respect for him, and NASA had some pretty good procedures and certainly produced results.

Q: Would you say that the contributions to the space program were the outstanding achievement of the Corps during your term as Chief?

A: Well, they were sure one of them. It depends on your point of view. I personally think that one of the best accomplishments was to keep the Corps of Engineers alive. Of course, you also had the war in Vietnam beginning to develop, and we had the civil works program boiling along at a pretty good rate. We had changes in the military organization and so on. I don't know, it's kind of hard to say.

The Arkansas River program got going along, and to this day I am amazed at its success. Long before I retired I was down in the Arkansas basin area, and they just kept pinning me down on when it would be

completed. I kept saying that I didn't want to commit my successor. But they wanted to know when it was going to be ready, and finally I said, "Okay, it will be in 1970." And five years after I retired, it was ready. I'm amazed that it worked. It was a good program. It was a big program. It took a lot of overseeing, however, we didn't have really any organizational troubles during my time. We had outstanding people except for the one thing we are going to talk about here in a few minutes.

I don't know of anything else you want now. I think the space program has been well covered. Doing the job correctly, being responsive, getting construction done on time, having a good organization, I believe are the highlights in the era of Corps support of NASA.

Q: Could we talk about the reorganization of the Army during your term as Chief?

A: When did you say it was proposed?

Q: In 1962. You were Chief at the time, and the Corps did not lose its Chief as others did. I would be interested in your giving some of the background that you recall from this reorganization effort.

A: General Hall was the man we put on that board, wasn't he?¹¹⁴

Q: Yes, he was in personnel.

A: So he was in on the whole works. We detailed him to that study board or whatever they want to call it. Yes, I remember. I'll do the best I can.

Q: Well, I'm particularly interested in how much you feel that your own personal response to what was being proposed helped the Corps keep as many of its functions as it did.

A: You're going to make me sound like I'm tooting my own horn if I'm not careful.

Q: Well, I'd say that some others have suggested that your role was crucial. Let's put it this way, you were Chief of Engineers at the time and if your response had been different the Corps could have

lost a lot more than it did. Other services did. And you said earlier that you thought this was one of your outstanding achievements.

A: Yes, I do. Well, as we've said earlier, I wasn't looking for the job of Chief of Engineers. I'd figured I'd come through some pretty tough battles up there in the fifties as deputy chief. I wasn't hunting for an opportunity to go through it any more, and suddenly I'm going to be the Chief of Engineers. It was a great honor and a privilege. One reason this turned out so nicely was that I was told by the vice chief of staff to stay in Quarters One at Fort Belvoir. That was time consuming for me riding back and forth, but the family was very happy with the decision. So I enjoyed it too.

When I came up to the Chief's office, I didn't have too much trouble getting read into things because I hadn't been gone but about eight or nine months. Very shortly thereafter I became involved in the space business and that was an exciting opportunity and took up a lot of time. It was a big feather [in its cap], I thought, for the Corps to be in that business.

Then good old Secretary McNamara reared his ugly head.¹¹⁵ We kept getting more and more indications of reorganizations and changes and switching missions and things of this kind. I had to work fairly closely with some of his staff on a lot of things. We were in the housing business for the Army. One thing that got me down was when I was sent to meet with a Mr. Yarmolinsky, who had moved into office maybe about two months before.¹¹⁶ I checked up and found that his principal experience prior to this time had been as the executive of some charitable organization with a staff of about four. And I was there discussing with him how we should organize for the housing program. I'm just trying to remember what happened. He began explaining to me the ways you manage and execute and organize. There were no ifs, ands, or buts; you did it that way or it was no good. And I said, "I think we're supposed to be analyzing this, aren't we?" Well, this was typical, to my way of thinking, of much of the attitude during the McNamara regime. They were the experts on everything. And on many occasions, many

occasions during the rest of that time, I ran into the feeling, the very clear feeling, that many of the McNamara studies were made after the decision had already been reached, and the studies were primarily to prove that the decision had been correct. This applied on many things including the reorganization of the Army.

Now as far as any decisions we got for the Corps, most of them weren't too vital except for the reorganization of the Army. And the reorganization of the Army, as far as I could see, had been an edict from DOD and at the Secretary of the Army level and that of Chief of Staff. They had more or less been pointed in that direction. Now, how enthusiastic they were about being pointed in that direction, I don't know. But I suddenly woke up to the fact that the Army was going to be reorganized and all the technical services were going to be decapitated. They were going to lose their head men. They were going to be treated the same as the artillery and infantry and other combat branches had been treated in recent years. It didn't make too much sense, but there it was. It was going to happen without much question. We had always been able to combat something like this to a degree on the basis of the civil works program, but in the eyes of the people working this thing up, that was just a little problem on the side that shouldn't be a governing factor. We tried our best. We wrote the right things up. We made analyses. I was fortunate in that General Decker was Chief of Staff at that time.¹¹⁷ He had been chief of staff of the Sixth Army at the time Sam Sturgis was Engineer for the Sixth Army and had learned a lot about the use Engineers can be put to in wartime and the desirability of maintaining the capabilities that we had.

Q: Do you think some had forgotten that by 1962 since it was a time of peace?

A: Oh, yes. Let me put it this way. This same trend happens every time after a war when you reach a point where the commanders and those in fairly high position who have had experience in combat across the board have passed on, retired, and disappeared from the scene. And the young ones coming along are gung ho, but they don't recognize the

requirement for logistics and engineers and the like. It isn't until they get in the middle of a big struggle and need some roads or airfields or river crossing support, when suddenly they begin to see that there is some advantage in having engineers for removal of mines and for ferrying operations and the like. And this was one of the interim periods.

Now Decker, going back through his service with Sturgis, had a lot of respect for the Corps. He had told me with obvious pleasure that he was pleased to see me become Chief of Engineers. I don't know how much he had to do with accomplishing it, but he was Chief of Staff when I made it. And I had worked with him while I was deputy chief. In fact, he intervened in the tail end of that Air Force fight just at the right time. He supported us and more or less helped us stand down LeMay and a few other people. I said I didn't know the turning point, but General Decker's support was really the culminating action that started the conflict downhill instead of pushing up all of the time.

So now I went to see him about the reorganization and talked with him. Basically, I got the feeling that he didn't necessarily like the concept, but it was something that had to be analyzed, and they hadn't made up their minds yet--don't give up the ship. But it was pretty obvious to me that this reorganization and elimination of branch chiefs was the coming trend. And a lot of people in the Army were pleased to see it happening without any question because, basically, in my opinion, the infantry, armor, and artillery crowds had felt like they had lost their father and mother. Why shouldn't the ordnance, Engineers, quartermaster, and all the rest of them do it too? So many people in the Army were pleased with the coming change.

I'm an old-fashioned fogey and don't believe infantry, armor., and artillery should have lost their chiefs either. I believe it was desirable to have some senior attention focused on the development of the careers of the people in each of these branches. I think we lost something when we took that capability away because now you just have in essence a few motivated lower ranking people

sitting at the personnel desks for three years, and then the next men come. There isn't any continuity that I can see. particularly for the combat branches, and the same thing must be true now for the quartermaster and signal [corps] and everything because the personnel business is run by short-term assignment. Except that the Chief of Engineers can still talk and suggest and at least be looking.

Q: Didn't the combat branches lose the personnel function before 1962?

A: Yes, that's right.

Q: Then your philosophy was that it was an accomplished fact. Just because others had lost personnel didn't mean the Corps should.

A: And we had the problem of the Corps of Engineers, it wasn't a problem, it was a pleasant situation, of having the civil works program. We had to retain some degree of existence in order to continue to do that. Even between wars the Army wasn't necessarily too excited about supporting the Corps of Engineers. They thought that in many instances we had a boondoggle. But when you got to the people who had seen the Corps in action in major wars, you got pretty good support because our point was made that this civil works program gave us an opportunity to develop talents and experience and skills of the personnel that in turn paid off in the war to the military. And there's no doubt about it, it did happen. Your Wheelers and your Clays and your Clarkes and all those people. Now Clarke didn't have any real connection with civil works except he was in the system. He may not realize it, but being in the system he was benefiting to an extent. But you had an awful lot of people who did well and showed up well and got an opportunity to do big things that they couldn't possibly have done if you had nothing but some sidewalks and some tennis courts that you get funded normally in a troop construction situation.

In every war and between the wars, you have a drop in this Army support and as again I say when the shooting starts and somebody wants a man to go out there and remove the mines or put a bridge across or blow an obstacle, suddenly it begins to come

back the other way. George Decker was completely supportive of us to the extent I think he could get away with, that's probably what it amounted to. However, I'm not too sure he was still there at the time the final blows came. I think he'd retired and "Buz" Wheeler had moved in as Chief of Staff.¹¹⁸ And he was a much more theoretical gent than George Decker. But anyhow we went back over there time and again, and we had opportunities to present our views to this committee and so on, and it was clear that their minds were made up. I didn't know quite what we should do. I knew one thing, I knew we better do all we could to maintain contact with the Army. So I told my top people that. "Look," I said, "anytime we get any kind of a question or inquiry from the Army, let's give it the real go when we respond. I'm going to go to every meeting that I'm invited to. I'm not going to have an excuse that I had to be on the Hill working on the civil works program. I'm going to be available, and if I'm not in town I want my deputy to be there no matter what. Whether it's a little insignificant thing or a major thing, let's show them that we are part of it." We got a few chances to soften the words a little bit in some of the findings, not enough to really make much difference, but I really think what happened to save us was to a large extent our capabilities.

One capability you wouldn't necessarily think about. About this time while this is all flowing along in that direction, there are efforts made to get all the tech services to join hands and go to the Hill and all this kind of business. I just said, "No, the Corps of Engineers is going to take what the Army decides. We're not going to go around behind their backs to try and solve it. We're sorry if it's hurting some of the other tech services, but we're going to play the game by the Army's rules." About this time things began to hotten up out in Vietnam, and there were requirements for better intelligence and better analysis. I don't remember how we first got in it, but at one of the regular meetings of the Chief of Staff the point was made that we needed to have a quick study made of this and where can we get it done promptly.

I think I spoke up and said, "I can get it done for you in our Strategic Studies Group." They said, "What are they?" I started explaining. They asked, "You have one of those?" I said, "Yes, we have one of those." They wanted to know where we had it, and I told them it was out at the Map Service. "Why do you have it," they asked. I said, "We have it for the Chief of Engineers to have the capability to make recommendations to the Chief of Staff and [to] support the military plans of the Army if the opportunity offers." So they said, "Get us one." We had a recommendation and backup in about three days, and it hit just right. About that time the Chief of Staff said, in essence, "I want Wilson at all our staff meetings considering Vietnam [that] we are now conducting because he's got this tool we can use and we need him." So I suddenly began getting invited to the senior staff meetings of one kind and another which we hadn't been doing for a long time.

We kept using the Strategic Studies Group as a key to unlocking some of these things. And they did a beautiful job. There was no 'place in the whole Army, intelligence and all, that had the balanced, cohesive group pulled together with a capability like we had. And suddenly I had the opportunity in the staff meetings to speak up and make recommendations. I kept recommending that we promptly send some means over to Vietnam to improve ports and prepare for receipt and storage of supplies and equipment, so that if the decision was reached to go we'd have something to land on and a place to put our supplies. I'll put it to you this way, within the next three to six months, we had rejoined the Army on a pretty high level.

Whether the Chief of Staff made .the change or what, I don't know. But suddenly when the reorganization plan came out, we retained a presence. It was a pretty well-chewed--down presence. We lost most of our troop operations staffing, we lost direct control of personnel, but instead we had to operate through a branch of the Army's personnel organization that stayed with us in our building, and we had direct access to them. Basically, it enabled us to give to the Army the kind of support that was necessary in getting ready for Vietnam.

In our own office, I made a decision [that] we were going to comply with their directives, but we were still going to retain some kind of a unit that could monitor troop "ops" for the Chief of Engineers, nothing like we had had before. We weren't going to fight the problem, we were just going to have this unit and keep some airfield capability. One particularly qualified man was being tempted to go down to Vicksburg lab and leave the Chief's office. He'd served in OCE a long time and had been an outstanding representative of OCE on various troop planning groups. He knew his way around airfield construction and things like this. I talked to him and said, "Look, I can't tell you not to take that job. I will tell you that I am going to do my best to continue to hold a presence in your field if you can stay with us. It's my feeling that in a matter of a year or two you will find that you are far more influential than you are today or were yesterday." He gambled on me and stayed.

That's the way we tried to keep our hand in under the reorganization. We got way down in size, but we still kept that Strategic Studies Group out at the Map Service, and we used them frequently. We still kept just a little bit of capability to go speak on the tactical side to the Army. Within another six or eight months that was becoming more important. And the first thing you know, we began to rebuild a stronger capability. We rebuilt an intelligence capability as Vietnam requirements came along.

Q: What more can you say about the Vietnam involvement while you were still Chief?

A: Well, I can only say that it was developing and as it got more important, there was a lot more time devoted to it. We were rebuilding this capability. I was going to every staff meeting I was invited to, or my deputy was going. We got much more involved. I made a couple of trips to Vietnam. I had my deputy make a couple of trips. In other words, we were trying to be ready to help if there was something they wanted. I think it paid off. I think that's what did it. I don't know. What did Bill Hall think?

Q: Well, I think he felt some of the other tech services lost more because their attitude was different. Of course, maybe they didn't have as much to offer.

A: Well, they probably didn't, that's it.

Q: And maybe they didn't present what they had to offer as effectively as the Corps did.

A: That could be. We got another break I think before the end of my tour. Earle Wheeler, as I say, was more of a theoretical man and he moved up the ladder to joint chiefs, if I remember rightly, and Harold K. Johnson moved in.¹¹⁹ Now Harold K. Johnson I'd never known. He'd been a prisoner in World War II, but he was a pretty solid citizen, levelheaded. I found with a little educational effort on my part I got him around to thinking in terms of what the Corps could do for the Army and the benefits we got from doing the civil works program, the NASA program, and having these outside jobs that didn't cost the Army anything but a few spaces. Didn't cost them any money, and it gave our people a tremendous free education without the Army putting the money up. I think that after he took office, at least for the next year-and-a-half before I retired, we had it back on track. Now, it was not the same situation it had been before, but it was not too different.

Q: And a lot better than it might have been..

A: A lot better. During this same era we had one exciting period when Kennedy got shot. I was living down at Belvoir. It was on a weekend when everything broke, and they decided suddenly--I guess it was probably Friday or Saturday--they decided they were going to bury him in Arlington. That really put us in the middle of things. We had to get over there and locate the grave, work with the cemetery staff, survey the plot, and recommend its location. I assigned Major General Jackson Graham as our personal representative on the group that was getting everything coordinated under McNamara's direction.¹²⁰ Shortly, I asked him to give me a report. And he said, "You know they're talking about putting this grave right in front of the Lee house." I said, "Oh, brother. Your mission is to try and get it down over the military crest?

This was not necessarily too easy. Secretary McNamara was Jacqueline Kennedy's personal representative at the site. But, actually, we succeeded. We got the grave down. It is a very lovely spot, just about where the military crest is, but the crest of the hill itself with the Lee mansion is far enough away that it can be looked at as separate. I credit Jack Graham with having accomplished this action, which I think was a service to all citizens of the U.S.

Now 'about that same time it developed they wanted an eternal flame, and guess to whom they turned to get the eternal flame? They decided on Sunday they wanted the eternal flame. The funeral was on Monday. So, suddenly, again a mission arrived to the Chief of Engineers, this time to produce an eternal flame by the time of the burial in the morning. We immediately assigned the mission to General Cassidy, who had been my deputy and had replaced me at Fort Belvoir as commanding general. So he called on his specialist training people to come up with something. We all got together on the floor of an Engineer School building with a concrete floor, where we laid out different things that might work and tried to figure out what we could do. We figured we couldn't possibly get in a permanent gas line that soon. We'd have to go to butane gas. We'd have to get several bottles of butane gas and put them in a bunch of shrubs there and run a tube underground over to the grave site. And where could we get the thing that would produce the flame? Well, we started hunting and we found people who knew where such things could be. And we started people clear up in Maryland going to pick up some of these things and some butane gas tanks. We designed right on the floor there the concept of what would be the eternal flame. The school troops began fabricating it.

The next morning early I went up to Arlington to see how we were doing, and there they had it. It was all ready to go. As a matter of fact I tested it by lighting it because I didn't want it to blow up or cough or something on Mrs. Kennedy. So I was given the privilege of lighting the first test run. And it worked. I looked where the grave had been dug. It was a very nice location. I was very proud of the fact we had gotten Jack Graham, who

was capable of getting it there. I looked over and the grave was oriented on one angle, and Memorial Bridge, which was supposed to be what it was aimed along, was on a different angle. I went running to find the cemetery manager, who said, "It's all right. When we put the equipment over there that lets the coffin down, we'll line it up right." The hole was bigger than the coffin, so that was no problem.

I ended up doing provost marshal's duty out there, too, because just as I was standing up there looking and deciding to go home, here came busloads of people. And they started tramping all over the grass and running up to look at the grave. I started running out and waving them aside and hollering at them to get off and go around, come around the road, stay on the roads. Pretty soon an MP showed up, a major I guess he was, and he said, "Thank you, sir. You have it started, now I'll take over." And he took over and organized it from then on. It was a remarkable achievement to get all that done and it showed up pretty well. That didn't hurt us with McNamara, I'm sure.

Oh, incidentally, the edict that came to me, presumably from McNamara, transmitting Jacqueline Kennedy's request, was that this eternal flame would have colors shifting all the time. I just told the emissary that came to see me, "That's fine. I accept the fact that you told me. But I'm going to tell you now, we're going to have a one-colored flame. We're not going to make a Coney Island out of this thing." And so, right or wrong, we got a one-color flame, and she was very happy with it. I feel that she didn't know that somebody had made that suggestion. I didn't go looking for somebody to cancel it. I just said, "I'll produce a flame and you'll like it." That didn't hurt us at the Defense level.

We also got involved then in hiring the artist that was to design the tomb and in supervising the construction. And this was all worked pretty closely with McNamara's office. He was involved because he was a Kennedy friend and he was Secretary of Defense. But again, little things like that helped ease the pain. And about that time the Chief of Staff was Harold Johnson, and I

think he saw the point and supported our views pretty generally. So the slide terminated at a point leaving us hanging a little bit over the precipice but not all the way. And to the best of my knowledge, while I was there we rebuilt our position pretty strongly and I think that same thing applies for some years after that.

Q: How was the Corps' relationship with Congress during this time?

A: It was pretty good. I'll tell you, with the effort I was making towards being in the military picture, I carefully allowed and encouraged the director of civil works to have most of the contact up on the Hill. So I didn't spend a whole lot of time there.

Q: Who was director of civil works at the time?

A: Jackson Graham was director of civil works and a good one. So rather than me running up there and responding quickly, I figured it would be better for the director of civil works to do it. It worked very well as far as I'm concerned. I saw lots of them at parties and occasions. If there was some reason to go, I didn't hesitate to go.

Q: Did Congress get involved in the reorganization?

A: Yes, to some extent. But I don't know how thoroughly they supported us. We were just a little bitty cog in this whole thing. They had a veto power. They had given authority for the reorganization. I'm not too sure how effective they would have been, although I'm sure some of them would have spoken up and tried to protect us, particularly in regard to the civil works program. But again, I tried to avoid stirring them up.

Q: How did you get along with Presidents Kennedy and Johnson?

A: Fine with both. Jack Kennedy was personable and pleasant to be around. Outside of one or two phone calls, one of which I have already mentioned, my main contacts were on trips to dam breakings or dedications or a visit to a major civil works project, such as a visit to Oake Dam, where he, Secretary of the Army [Cyrus R.] Vance, and

Secretary of the Interior [Stewart L.] **Udall** stopped for an inspection and briefing. And there **were** limited social contacts.

President Lyndon Johnson I had known as a senator, and I had met him occasionally as vice president. He knew his way around the White House and he knew our strengths and our problems. When his staff asked questions or for any assistance, we responded promptly with what we could do. When they wanted something that we didn't think we should do, we politely suggested that this was not for us. Again, I had fairly frequent contact on groundbreakings and dedications, and less social contact. But as far as business, I didn't get called to the White House by either President very frequently.

Q: Did you still have the phone link with the White House?

A: I don't remember but two or three calls, mostly in the Kennedy regime. I presume it must have still been there with Johnson, but I don't remember. I know that I stood at attention promptly whenever that phone rang.

Q: What were the most important civil works projects when you were Chief? I know that you stressed the importance of comprehensive river basin work, planning, and that you created a deputy director in civil works for comprehensive river basin planning.

A: Well, we got started on the Cross-Florida Barge Canal. We did get more into the comprehensive basin planning and, as you say, we did some reorganization in civil works to give added strength to that. I think it was necessary and useful. We had a lot of major basin problems that had to be worked on and solved. We had a lot of major projects that were coming up for authorization. I would say we had about a balanced civil works load **as** compared with prior years and subsequent years. Of course, we had the usual floods and flood fights.

Q: Do you have any recollection of the controversy surrounding the Kinzua Dam project?

A: That was a troublesome project, the Allegheny or Kinzua Dam on the Allegheny River in Pennsylvania. It was authorized and funded by the Congress but since it involved relocation of some Indian towns and cemeteries, the Indians, the Quakers, and the Today Show, then featuring Hugh Downs, took up the cudgels. Many federal agencies, including the Corps of Engineers, did their best to overcome objections of the Indians and several modifications in the project were approved in the hope of so doing. But apparently nothing would satisfy the Indians but to stop work and leave them alone. Old treaties by the fledgling U.S. and the Indians figured in the arguments. And as long as the Indians weren't satisfied, the Quakers weren't satisfied, and as long as the Quakers weren't satisfied, Hugh Downs would continue to feature the project on TV.

We tried to interest Hugh Downs in visiting OCE to let us show him any documents, or calculations, or plans that he wanted to check on. But he refused and insisted that I come and discuss the problems on Today with him as the moderator. Jackson Graham, director of civil works, finally went, and as we had expected, got far less than a fair shake from the moderator, who clearly favored the Indians and the Quakers.

But about a year later, Hugh Downs consented to spend a day in OCE. We opened up our files, answered questions, and convinced him. Before he left he told civil works that he had been misinformed and was sorry he had presented an incorrect picture of the Corps position.

Later that week he spent a few minutes on the Today Show repeating his statement, but it attracted little attention. However, the opposition gradually died out, and the project is complete and in operation.

Q: What about disasters during your term, like the Alaska earthquake, for example?

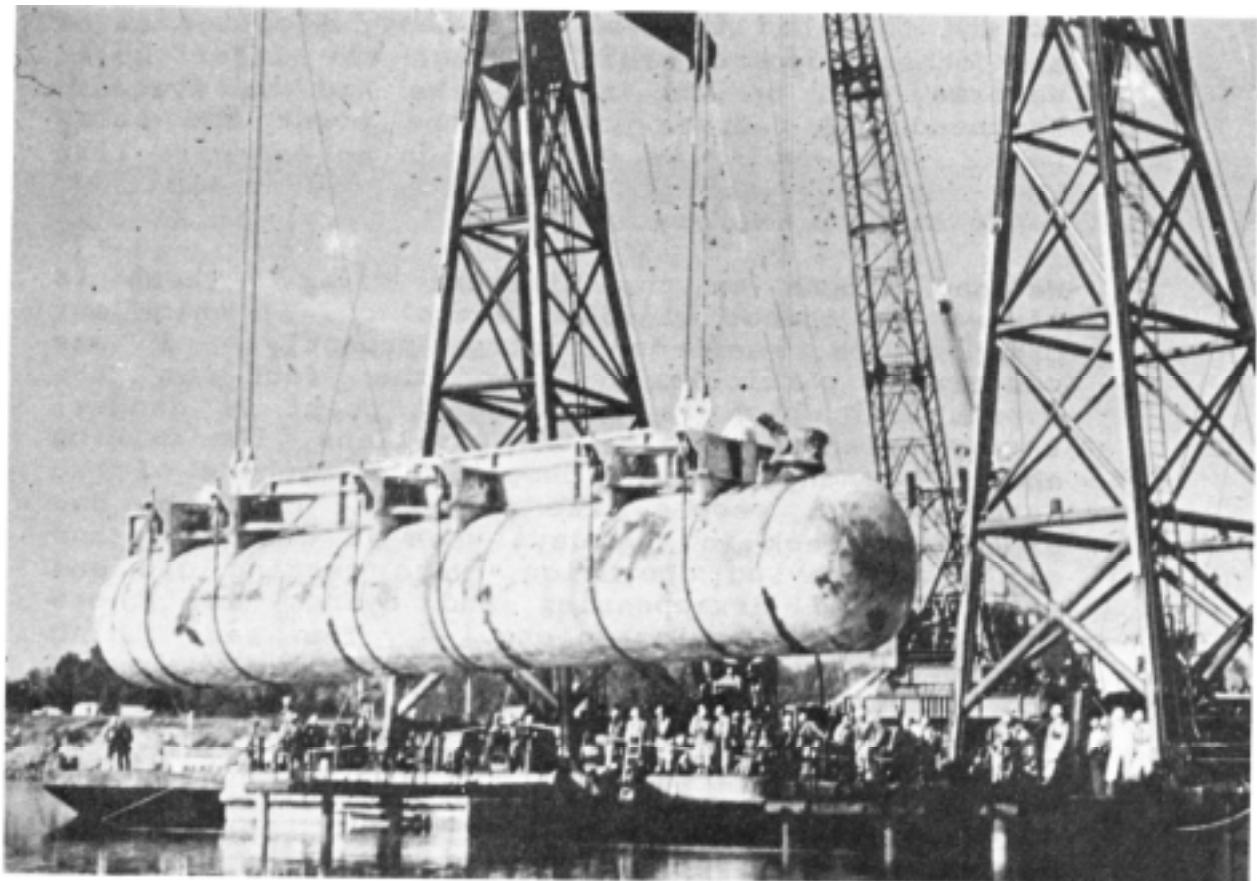
A: Well, the earthquake in Alaska was quite a change from the routine. The normal government agencies that should have handled it were pretty slow getting cranked up. I made a couple of trips. I

went up with the secretaries of HEW and two or three of the agencies on the civil side that could have done the job. When we got through and saw everything and came back, we more or less agreed that the Corps ought to get into it with both feet. So we volunteered and were directed to go ahead and do it. We collared experts of one kind and another and got them up there pretty fast, and we gave additional authorities and monies to the Alaska District. Again, it was a joint federal effort. We weren't running high, wide, and handsome. We had certain basic things to accomplish which I think were pretty darn well done.

That earthquake was really something. The place with the pretty homes near Anchorage was a sad sight. It was amazing. It looked like a loaf of precut bread, and you just took the pressure off one end. Quite a few of the streets and homes had just gone over the brink. There were a lot of engineering decisions that had to be made in Alaska. What was safe to rehabilitate and what wasn't. We participated in that to a large extent. But it was more or less under the same procedures as a standard disaster business where certain other agencies call the shots, and we offer our services. If they take them, we have certain designated authorities and requirements which we can then carry out.

"Operation Chlorine" was a nerve-wracking experience for quite a while.¹²¹ A barge with chlorine in it was in a wreck on the Mississippi River and sank. Everybody was scared to death the chlorine was going to escape and trickle up through the water and spread over the countryside. In the first place, we didn't know where the thing was. The Mississippi River is deep in that area--it was down just below Vicksburg as I remember it. The Mississippi River Commission and the Vicksburg District were involved. I think it was down towards the Natchez area.

We got experts and contractors that could work on it. We had to hire contractors clear over in Texas to come and bring equipment that could pick it up. Everybody was concerned day by day as time went on, and the tank was still under water. We located it fairly promptly and designed a method of picking it



Operation Chlorine, 1962. Crane Loading Salvaged Liquid Chlorine Tank Onto a Barge.



Anchorage, 1964. Residence Destroyed by Earthquake.

up and then had to send this heavy floating crane and other support craft through the Intercoastal Waterway and up the river. We had to evacuate thousands of people just in the event the thing blew. Once again, we got through an exercise like that with everything working. It didn't hurt our reputation in the region.

We had floods on the Missouri River. There is always the threat of flood someplace. I think our organization responds pretty promptly. I was concerned particularly over the fact on the Mississippi which is the biggest point of danger; the experienced people, the civilians, I'm talking about the nongovernment people, the members of the levee boards, people like this, the ones who had experience back in the days when it was touch and go, a lifesaving operation, were getting old and retiring and disappearing and dying, and there wasn't enough coming along.¹²² The same thing was to some extent true with our civilian employees and our military. A flood fight behind a levee is just a different kind of operation. How you ring around a little hole with sandbags to raise the head and keep the hole from expanding. Just lots of things like that.

I do know that during this period, whenever we had an opportunity to get into a flood fight, we tried our best to bring people from other Districts and Divisions there to work on it and gain experience so that we could reeducate. We went out of our way to take some of the levee board people. Pay their way, take them in an airplane, and take them up and show them. Let them see what was going on at some other site, which I believe will pay off. I think it is something we've got to keep up in the Corps every five or ten years because that expertise dies off.

Q: And that is one of the major strengths, to have that expertise available for emergencies?

A: Yes, that's right. But again you have to look to the levee board, the privately elected or appointed people,. because they have lots of the responsibilities. Unless you kind of encourage it and make it possible easily to do this kind of business, they are just not going to think about it.

Q: When you were Chief of Engineers, you stressed that hydroelectric power fit into multipurpose projects and you said that it shouldn't become the stepchild of such projects. Could you comment?

A: Are you talking about whether we should encourage or discourage hydropower in the projects or whether we ought to build projects solely for hydropower, or what?

Q: How do you feel hydropower fits in? Should it receive greater consideration in planning multipurpose projects?

A: Well, I'll put it real simply. Hydropower is a particularly useful kind of power because if you have it and it's stored, your water is available and can be turned on on instant notice. It doesn't take a warmup time or a break-in time or anything like that. So the more times you can have potential power, not that you don't want to use it regularly, but the more times you can have additional potential power sitting there in the form of water in an elevation where it can generate in a hurry, the easier time the network countrywide has of accepting -problems and overcoming them. I personally believe that wherever we can generate hydropower without it costing us too much money, by that I mean where the benefits exceed the cost, I feel that we should try and include it.

Now that runs afoul of some of the environmental things in that when you build a reservoir you drown out a lot of land. But if you are going to have a project anyhow with a reservoir and so on, I'm convinced that if you can add the power to it, it is a desirable thing. I would hope that you would normally sell it through existing systems rather than setting up separate government distribution things. There are both. I'm not going to say you shouldn't let the government have it too, because I think we should. But you should use existing organizations and add potential to those in preference to adding new organizations solely on the basis of the federal hydro.

Q: What do you see in the future?

A: Well, the reason I don't say there is a greater future is that we are running out of economically developable sites to a large extent. As you develop these projects, you are using up one place. What would bother me would be to see you building something in a location which could be hydropower without including it so that you lose that opportunity. It is **never** going to be the major power source in this country. But it is particularly useful when you are trying to run a network like Alabama Power or Southern Power. There is a complete lack of problems in cutting it off or putting it back on. There's no problem, whereas with a steam plant or some other power source, you can have difficulty in an instant shutdown.

Q: We haven't said much about the environmental movement and the increasing demands on the Corps to reflect a greater awareness of environmental concerns.

A: Basically, that has blown up since I retired. Now I did describe what we went through in the St. Paul District, and in all honesty I still maintain that the Corps was one of the first environmentally aware agencies in this country. Like the public parks, the Corps established a lot of those like Yellowstone and others and got them started. I believe that we were already--take the anadromous fish in the Columbia River basin--we are doing a tremendous amount of work to prevent damage to fish life of that area, and we're trying to compensate for the effects of interference with the salmon runs. That's been going on for one devil of a long time.

Now, we were not quite as environmentally aware back in my day as people of today as a result of some recent activities. If you are talking basically of when I was Chief of Engineers, I don't think there is much more to say about it. We had beach erosion thoroughly analyzed but it was a pretty expensive problem to correct. I was president of the Beach Erosion Board as deputy chief.¹²³ I was [chairman] of the [Board of Engineers for Rivers and Harbors] as the deputy chief also, and this gave me a chance to know what was going on in civil works to a large extent,

because the culmination of their efforts would appear on the desk every so often. We had a lot of environmental happenings or influences in the beach erosion field. We pumped in the beach down here at Biloxi, which was one. But again, we weren't as concerned as we might have been of where we put spoil from dredging,. But as far as the hunters and the fishermen, I'm pretty sure we were thoroughly aware of them and their wants and desires. They didn't have quite as big a clout then as they do now, although they had a pretty good size one. When they wanted to get stirred up on something, you had to listen.

Q: Given sentiment at the time, do you think more was expected of the Corps than should have been? The indication is that you maybe weren't as concerned about some things as you should have been, but --

A. But we were a lot more concerned than most everybody else. That's what I'm saying. What I've seen standing on the sidelines--and I've been involved in it here in the Mobile area since I retired--there was some good that came out of the increased emphasis on environmental protection. However, I'm not sure yet that they have accomplished as much as it cost the country in terms of rules, and changes, and prohibitions against certain things that are going on in the name of the environment. But again, the awareness was a desirable thing. It's true with the Corps as well as with everybody else. I would say that the military in the Corps have accepted the requirement more promptly than some of the oldtime civilians, although by and large the Corps has, in my opinion, responded almost too well. It's now almost impossible to accomplish anything.

Q: Do you mean because of the impact statement requirements?

A: Oh, not just the impact statements, the whole thing. We've got some local channels here that have been in the "just before start of construction" era now for over 10 or 12 years.

When you're just about ready to go, somebody else raises their head. And it just takes one or two standing on a street corner and hollering and

pretty soon you're stopped. And the Corps has gone through that so much that they tend to stop without waiting for a court to act, which may or may not be a good idea. But that's long after my retirement. I'm on the other side there.

Q: And how do you react from that vantage point?

A: I think they've gone too far. The pendulum swung, and it's time to swing back a little bit.

One of the interesting projects during my tour that I'd like to mention was the expansion of the military academy. I had some fixed ideas on the subject but that wasn't the main point. The main point was they had to be done. The military academy had a planning board and came up with concepts, and we assigned the mission to the North Atlantic Division and the New York District. To be sure we got off on the right track, I personally went up there several times and met with the planning board and the superintendent. There were many, many studies of ways to get traffic around the main parade area, the plain, but the goal really was to pretty near double the size without changing the basic appearance of the military academy. I'm convinced that the results today show that we really succeeded.

We had an architect-engineer: we had the District and the Division: we had the Chief's office: we had the Pentagon, and the board up there, everybody involved. But basically what we did was build additional barracks outside the line of those that were already there, to about the same height the current barracks were, but with lower ceilings so that we got five floors where there had been four. We changed the design. Instead of having a stairwell going all the way up to the fourth floor and serving just four rooms on each floor, as had been traditional forever, instead of vertical living, we went to horizontal living. This saved space, and also with the fifth floor, we actually got in essence twice as many people living with the same per-person criteria that we'd had before without really materially changing it.

Now when they got the barracks finished on the outside of the old quadrangle, then they took down

the ones inside and moved the cadets over. They left one of the old divisions standing there. They came to me to ask if as Chief of Engineers I had any objection to leaving the first division of central barracks. And I said, "Do you happen to know where I lived my four years at the military academy? I lived four years in that first division, so you have a strong supporter in saving the first division." The mess hall was the key to the thing. The way we solved that one was to build a mirror image of the original one, which had been back into the Rocky Hill, a mirror image of it out towards the plain. You look at a picture of it and you won't notice any difference, really, it's right between the two barracks. You've got twice the number of seats, the same poop deck or whatever you want to call it, where the officer in charge and the officer of the guard sit. You could look both ways up there. They did a beautiful job. And by moving the barracks out to meet it, it doesn't look like there has been any real change.

The major problem, that beautiful chapel with a gorgeous organ, couldn't stand explosives too close to it. You couldn't dig the rock out without endangering that. But we ended up with what looks just about the same. Now there were other features, hospitals and things like that, but a lot of effort went into the design, the layout and concept. Several academic buildings were done at this time or later, after I retired. The main living features were what we got going on strong while I was Chief. These other things went along later. There was a new cadet activity building, a new hospital, a new academic building, and a new library. The new library came while I was Chief and nearly caused me a divorce because my wife found out about it and asked how we could tear down the beautiful old one. We've got four times the library in the same square-foot space, and now you go up there and don't think anything about it at all. It's on the same location and utilizes more efficient design and everything. It's a darn good library building.

Incidentally, I was responsible for letting them get their stacks in. We had a problem of money, as usual, but I realized that if they didn't put their stacks in on all the floorspace they were going to

put them in to begin with, that there was going to be a terrific job of moving everything when they added additional stacks. so I found a way of getting a little more money to buy stacks on some of the between-floor floors that they added up there. So they could go ahead and plan to put the volumes in and put them in in the general areas they were going to have them stay right from the beginning. That made the librarian and the superintendent and a lot of people real happy. That was a personal decision on my part which I don't regret. It's a good deal.

It was a very interesting project. It's hard to do it with the cadets there and not interfere with them. But it was expensive; expensive to a large extent because of the location. There had been congressional investigations galore into the subject, and basically it's the labor union principles and agreements and wages and rates, travel time allowed from New York, all based on New York costs transposed up there. This caused a lot of trouble, and it almost killed the project. It got worse after I retired, and Congress questioned the veracity of the reports being given. After I retired I became a member of the consulting board appointed by the superintendent and the Secretary of the Army, really, to look into it and report to the Congress what the costs should be and why it was this way and that everything was being done to hold them down that could be and that we ought to continue to go or not continue to go. I served on that board for close to three years. I made at least nine visits. They canceled the board along about September or October of '73, figuring that the job was done--it had started in September of 1970. It had some high-level architects and engineers and academic types. M.P. O'Brien out at the University of California was a member of the board. General Johnson, the former Chief of Staff of the Army, was a member of the board. It was a pretty well-qualified board, and it was a pleasure to serve on it. I was delighted to see it clear the air, and I think we did some good in reestablishing a little confidence in the estimates. That came after I had retired.

Q: Could you comment on your part in getting the Corps involved in postal construction after you retired as Chief?



General Wilson (r.) with his successor as Chief of Engineers,
Lieutenant General William F. Cassidy.

A: I had an opportunity a few years after I had retired to do something else for the Corps, informally, in that when Red Blount of Blount Construction Company in Montgomery was designated, as the Postmaster General, to try and improve the efficiency of the Post Office Department and to have a big construction program under the Postmaster General, he asked me to come up and see him and offered me a position on his staff to handle the construction.¹²⁴

Q: Does your association with Blount go back many years?

A: Oh, off and on since I was down here in the Mobile District in the fifties. And later as deputy chief and as Chief, and, on one occasion as deputy, I called him on the phone, it was on the missile business, and said, "I don't want to see another bid from you until you've caught up with what you're doing. You're overextended." He protested a little bit at the time, but not very seriously. Almost a year went by, and I checked and checked again. And finally I called him and said, "Okay, we think you've caught up with your britches now. I'll withdraw my informal request." He could have bucked me on that very easily, and I'd have had a hard time legally keeping it up. But anyhow, I had known him pretty well and he did do good work. His problem was he got overextended.

I had guessed what he was going to ask me, so I had gone by the Chief of Engineers' office and talked with Bill Cassidy and Fred Clarke, who was then the deputy, and asked if they wanted me to suggest the Corps of Engineers. I told them I thought the Post Office Department would be a whole lot better off picking up an organization like the Corps to give them help than to pick up a gent, one man who'd have to build a staff and go through all the throes of that. They said it was all right with them if I wanted to suggest it to Red.

So I talked with Red for about an hour or so, and I said, "Red, I appreciate the confidence and I think it would be a fine idea, but I don't think it would be in your best interest. I think you'd do far better by hiring the Corps of Engineers_ just like NASA did. You've worked under them, you know

whether you think they're doing a good job or not. You'll get far better service for the Post Office Department and the taxpayer doing it that way than by me coming and trying to build up." And he said, "I don't want it. I'd rather have you, but I'll talk about it with my people." I said, "Okay, I'll tell the Chief of Engineers that you may be asking." He said, "Fine, you may do that." So very shortly thereafter, he got together with the Chief of Engineers and they activated the plan, and I believe that everybody has been satisfied that it was a good program, although I have no real knowledge of what happened to the program;

I had retained the home I had built when I was District Engineer and hoped to get an offer of a job in the Mobile area after I retired so I could come back and live out my days here. So I hadn't sold the house. We had rented it very successfully. We had 13 years of rental and only nine months' total vacancy during that period of time, and people generally kept pretty good care of it. The mortgage had been paid off, and the renters had upped the rent voluntarily to get me to add air-conditioning. So we had an air-conditioned house, paid for.

About the time it was known that I was going to have to retire, I got an offer from one of the companies in Mobile that I respected to come work with them, so I accepted. I went to Denmark and Sweden to the PIANC [Permanent International Association of Navigation Congresses] meeting in July 1965 and returned the first of August to go to work for Southern Industries Corporation. I joined them as a vice president and within less than a year was elected a director. Southern Industries is a small conglomerate with wholly owned subsidiaries and a variety of activities. Through its operating subsidiaries it produces and markets aggregates for the construction and chemical industry, including shell, sand, gravel, slag, and stone, ready-mixed concrete in a couple of cities, asphaltic concrete in several, and concrete block, chemical and agricultural lime, poultry feed supplement, all of this primarily based on oyster shell, 5,000- or 10,000-year-old dead reef oyster shell, which they dredge. By means of permits in the areas in which they are doing the shell

dredging, they have gotten into oil and natural gas on a small scale in that particular area. Generally speaking that's the kind of things they do, with anywhere from four to six subsidiary companies from time to time. It has been a very interesting job.

I deliberately told them when I came that I didn't want the pay they offered because I thought it was too much, I didn't mean to work that hard, which surprised them. But we made an agreement where I got deferred payments to some extent after I retired. I couldn't retire, because I'd ruin their retirement system, but I get deferred payments for about ten years after I gave up the directorship. I told them I didn't want to end up as president, I didn't want to be the big shot. I'd had enough of that. It took about a year to convince the young people working around through the company that I really meant it, and after that my life was very pleasant. I'd get called on for all kinds of problems, interesting problems where I could help them without taking over the responsibility other than that of a vice president and director in general terms. It was very fine. I gave them a little management study in the organization and made some suggestions, none of which they bought, but a year later all of which had been put into effect. I helped establish age 65 as a retirement age, and very soon I hit age 65, so I had to retire as vice president.

I stayed on as director and then they asked if I wouldn't change that to the status of a consultant so I could stay with them and do certain things with them, particularly keeping up with the various water organizations they belonged to, like the Water Resources Congress, the National Waterway Conference, the Warrior-Tombigbee Association, the Gulf Intercoastal Association, and American Waterway Operators. All of these things I had been participating in representing them and this saved them a certain amount of effort in the field, and I enjoyed it. They pay my expenses to go to these things and also those of my wife because I'm getting too old to travel on my own. It's a very pleasant situation. I do do them some good. I work pretty hard every now and then for a little while, but in the consultant field, no. I do just

as much as is necessary, and they more or less leave it up to me to decide which things I ought to go to; although every now and then they'll say, "Here's something coming up we wish you'd participate in." So I have got a small retainer and I have a desk, filing cabinet, and access to a xerox, and that's the extent of my activities at their office. It works very well. By now, we're down to where I go maybe two or three times a week for one or two hours at most unless it's something special.

Now in addition, we had a thing called Task Force 200 here in Mobile, which was the industrial development part of the Mobile Area Chamber of Commerce. It was a fairly big effort. Southern Industries more or less volunteered me to be their representative on this thing. It ended up with me being chairman of Task Force 200 starting about 1966, about a year after I had joined Southern Industries. I devoted a lot of time to that because also at that same time they announced that Brookley Field was going to close and the government was moving out, and I helped get the community to accept the fact that it was going to happen, to quit fighting it and to try to find out ways to get control of it and develop it and make use of it. It was a very interesting field and I got to meet the industries that were considering moving to Mobile. I really think I did some good. I stayed in that job until mid-1972, by which time I figured I had done my share of that and let somebody else have a chance at it. This really occupied my time. I devoted an awful lot of time to that for those years but no longer is that a demand on my time except occasionally. I still take part in the South Alabama Regional Planning Commission, to which I'm a consultant, not a paid consultant, I'm just a member of a citizen policy group. But a lot of these things I got into as a result of being the chairman of Task Force 200.

Also when I came down here I got agreement from the president and management of Southern Industries that I could be an outside consultant if I wanted to. It would be up to me to try and keep from reducing my usefulness to the company, but we could work out the arrangement necessary so I could take on work. As a consultant, as I mentioned earlier,

in March of 1966, I was a consultant to the premier of the province of Manitoba, Canada, in reference to their forecasting and flood-fighting plans for that particular year. That was extremely interesting. It took me back into the Red River of the North valley and let me renew knowledge of people and things that were going on.

In March of '67 I served as chairman of an arbitration board between the Idaho Power Company and Morrison-Knudsen and Perini on the Hell's Canyon project construction claims. This was more in line with the kinds of things I had done in the Corps. It was very interesting. It took a week. We ended up with a solution. There were three of us and we ended up without ever taking a vote. We talked ourselves into concurring on each step as we went along, and as chairman I just wouldn't let them quit talking until we got a sense of agreement, and then we'd move on to the next subject. I think both the Idaho Power and the Morrison-Knudsen-Perini people were satisfied with the results.

In April of 1967 I headed the team of three people to review the construction programs, procedures, and performances in Vietnam as an advisor to the Secretary of Defense. This was known as the three little bears wandering around Vietnam. We had Major General Gus Minton, who had been the head of the Air Force engineers, and Commodore Barney Hunter, who had been a fairly high member of the Navy construction agency, the Bureau of Yards and Docks.¹²⁵ We three went over there and stayed about three weeks. We saw a good deal. We got there shortly after Bert Perkins had moved in as the head of the M-K contract, which was a cost-plus-fixed-fee contract. I had advised him of the kinds of things he was going to run into in a cost-plus-fixed-fee atmosphere. Before he left I spent a whole day in Los Angeles talking to him at his office there letting him ask me any kind of questions he wanted. I was giving him the advantages of the experiences we had had in dealing with his outfit in Morocco and telling him the things to avoid and the things to look out for and so on.

We went over there and we very quickly discovered that the same kinds of problems we'd had in Morocco existed there. They had oversupplies of some items, too many people ordering--no control of that really, everybody was ordering. The material was coming in and they didn't have room to store it. I'm not talking about just the contract, I'm talking about the situation in Vietnam. We got into it pretty thoroughly. We went around the whole country. We visited a great number of commands and logistical facilities. We worked very hard in drawing up our report back in Saigon. Dan Raymond was the head of the construction program for the military at that stage, a corps of Engineers general, and we brought his people in with us when we sat down and finalized our report.¹²⁶ We got agreement pretty much on the recommendations and guidance that we gave and the places where we pointed to danger signs. Then we took off and went back to the Pentagon and reported to the Secretary of Defense with Air Force and Army participation.

Again, I believe we accomplished what they wanted--an attempt to convince Congress that you had some people with experience looking and not letting things run off. I think it was timed beautifully, because had we not done it, I think some of the things that were going on and were building up could have turned out to be more trouble. There's one little item. They had enough toilet facilities over there to last about a hundred years! Everybody had ordered. Anyhow, that was one interesting job.

I got asked to be an expert on flood-fighting and also a consultant on the construction of the Northern Power Plant Builders, which consisted of Northern Construction Company, a division of Morrison-Knudsen, on the Portage Mountain Powerhouse in British Columbia, a tremendous, big, underground powerhouse. My function was first to look at the cofferdam protection in a flood fight that was going on right then, June of '67, acceleration claims in connection with that flood fight, in connection with the work on the tunnel. I testified in the supreme court of British Columbia in reference to these and a \$50-million claim case. I was up there in May-June of '67,

March '68, August '68, October '68, January '69,
October '70, July '71, March '72, and March '73
The court case turned out pretty much the way I had
recommended to Northern Power Plant Builders. What
they were entitled to and how to go about it. At
least from their viewpoint, they thought this was
very successful consulting.

I mentioned earlier that I was a member of the United States Military Academy Planning Board appointed by the Secretary of the Army. I advised on planning, design, funding, and construction for the expansion. And that was nine visits to Washington or West Point over a three-year period.

I was appointed by the director of the Alabama Highway Department to a board to advise him on claims submitted on construction of a federal highway project on I-10, a tunnel under the Mobile River. This was to recommend to him what construction claims submitted had merit and what we thought ought to be paid and what we thought ought to be turned down. Again, it was a three-man advisory board. I was the chairman and we did it the same way we had done it out in Idaho. We took longer this time. We worked on it almost daily for about a month and came up with answers which the highway department accepted and apparently also the construction contractor accepted. During this period I was honored by being awarded the Golden Beaver Award for engineering in 1971. It is a construction organization basically drawn from the West, and it was nice to receive the honor.

Recently I haven't been looking for assignments. I had an opportunity less than a month ago to take on one, an arbitration that would involve one of the former Dutch colonies. It would be an international arbitration, with rules set up by the international chamber of commerce. The Indonesian government would be a party. To me it looked like it was going to take several years and a considerable amount of effort. It wasn't going to be a chance to really use my experience of the past. I was going to have to sit down and do a lot of engineering analysis and so on. So I said I appreciated it, and I knew it would have been nice money coming in but "Thank you, no. I'm not going to do it unless I'm the only man in the U.S. who is suitable for the job." That more or less typifies my current situation.

My office is across the street from where the District has moved downtown. I go by there, not too often, I try and stay out of their hair, but there are things I hear which would be of interest to them, and I try and get word to them. I try and encourage them to be involved with the Society of American Military Engineers. Up until recently my wife and I have been participating in many retirement parties in the Mobile District for civilian personnel and goodbye parties for the military, but it's getting now to where there's nobody left alive walking around the Mobile District that I really knew. I play golf nearly every day with two of my former employees, one of whom is the one who was the only man in the Mobile District junior to me in 1929. He was then a messenger and he retired as chief of the contract and procurement branch recently. The other one was the chief of the operations division, who knew my wife back up in Tuscaloosa where she was born before she ever met me. Basically now, I'm the yard man at 69 Kings Way, keeping up three-quarters of an acre, which is a time consumer. I meet with the Medicare crowd, normally around nine on weekday mornings, and walk pulling a cart for 9 holes, and get it over with before lunch so we can accomplish other things during the rest of the day. And on Saturdays I normally play 18 holes pulling a cart except in the hottest part of the summer. As I said, I go to the Southern Industries office up to three times a week and I keep in touch with things that way, distribute the material that comes from these various associations to the right places in the company, answer questions, do a little bit of calling, that pretty well covers it. Of course, I travel. I have a harder time ordering my day and scheduling myself and getting things accomplished today than I did when I was working hard. Well, that's just about it as far as I'm concerned. I expect to stay here until they haul me out in a box.

Q: How secure do you think the Corps of Engineers is today in 1978? Is it facing another situation like the one in 1962?

A: There's an erosion that probably will continue forever, but I'm confident that the Corps will bounce back and continue going strong. I can't guarantee that. Sure there's a problem. It's

going on right now as you well know, with each new Congress and each new administration. I think the situation is less risky today than it was a year ago at this time. I've got no way of knowing, I just know what I read in the papers. I hope the Corps continues to do the job and continues to earn a good reputation and provide a real service and then I think it will continue to roll.

Q: Do you have any suggestions for the Corps' historical program, for things that might be emphasized?

A: I don't know, that's kind of hard. You know there have been innumerable occasions in the past when the Corps has been attacked and I have participated in several of them. Each time it seemed to me that we had to go back to scratch to try and dig up the kind of information that's necessary to combat things like this. Whether your historical department could in the course of this kind of action put together a child's guide of rebuttals to raise, I don't know.

Q: Actually there has been an attempt to do just that.

A: Good, because I can remember the days when I was in the position of doing it without telling anybody and trying to keep us from sticking our heads up as opponents to everything, but at the same time finding the arguments. There were some beautiful things written by the World War II commanders that show the advantage of the Corps having the civil works program as well as military construction, the advantages we have over any other engineering organization and any military organization in the world as a result. But whether somebody can go put their finger on it now, I have no idea. I know there have been two or three starts in that direction since I retired. You can't necessarily go out and manufacture this at the moment when you need it. You need to be able to put your hands on it.

Do you have any other questions you would like to ask?

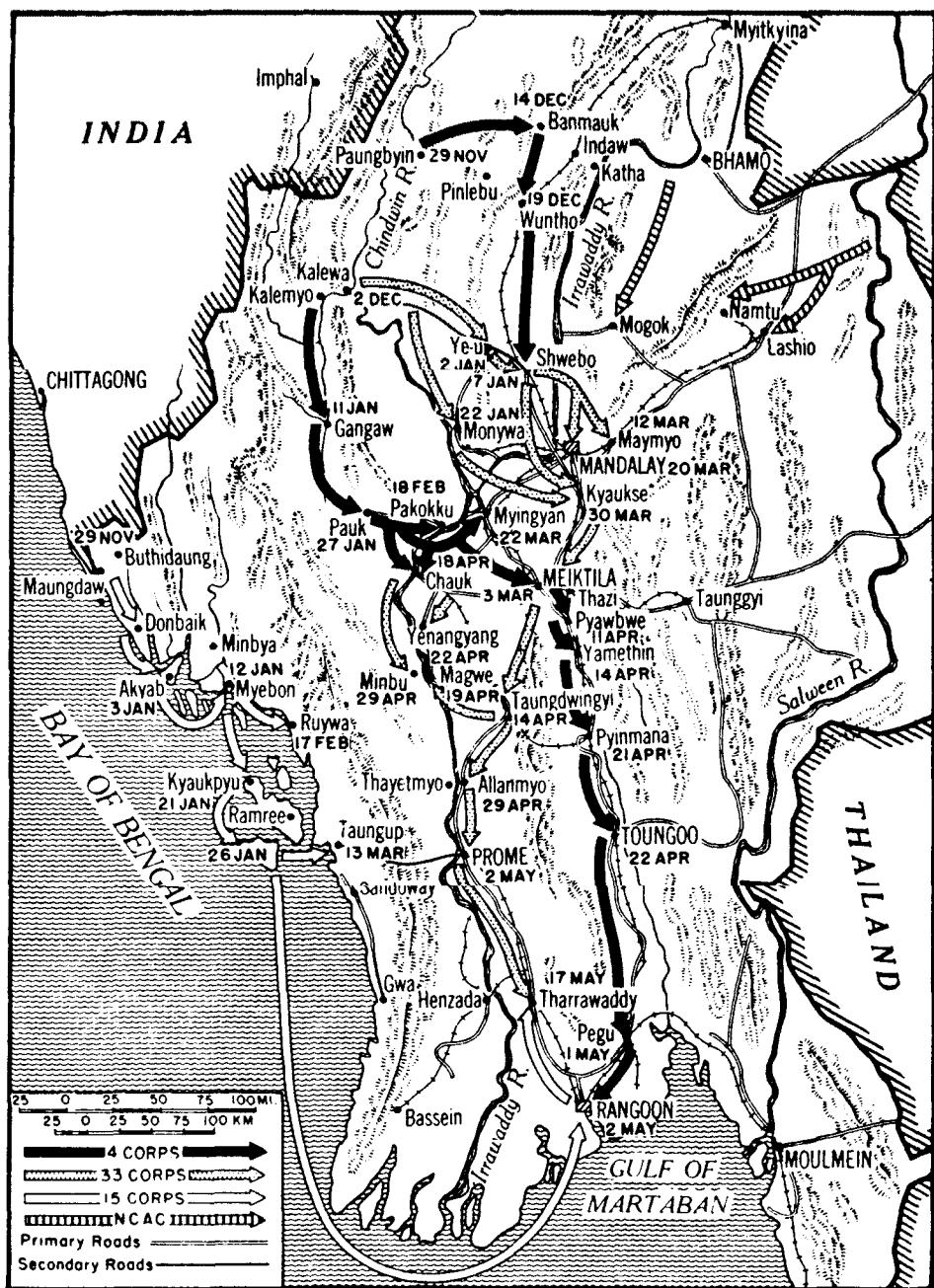
Q: Well, I suppose we could touch briefly on one last subject, the Corps' work with the Agency for International Development [AID].

A: We did quite a little work with AID, both during the time when I was deputy and as Chief, and it is a little hard to keep them separated. It was kind of an up-and-down action, I mean they'd be in a little trouble so they'd ask for help and then as soon as they got their feet under them they'd want to freeze us back out of it to a large extent. Quite a little bit of work overseas was done with AID funds.

Q: What were some of the more outstanding examples?

A: Well, one was the terminal building at Dhahran for the Saudis. There was work in Afghanistan on a highway, a tremendous project, which I got to visit on one occasion. I can't tell you offhand but there must have been hundreds more. But again, you couldn't plan on it very much for the long term because as AID people changed assignments they became more interested in doing their own work and less interested in letting the Corps move in.

Q: Thank you very much for your time. It has been a most -enjoyable and informative interview.



Operations in Burma. December 1, 1944 to May 17, 1945.

APPENDIX A
ARTICLES AND SPEECHES

"Logistical Support of British Operation in Burma in the Winter **of 1944-1945,**" by Brigadier General Walter K. Wilson, Jr., Deputy Engineer in Chief, Southeast Asia Command

In the summer of **1944**, Lord Louis Mountbatten and his Southeast Asia Command staff was faced with a logistical problem. The operational situation was as follows: Burma was still in the hands of the Japs. In the north, Chinese-American forces under General Stilwell were fighting for Myitkyina, the outpost of civilization in Burma in the north. In the northeast, British-Indian troops of the 14th Army were clearing the remnants of an audacious Jap offensive from the fringe of India and the northeast corner of Burma.

The mission assigned required the reconquest of Burma. The normal approach to Burma is from the south, through Rangoon. All communications in Burma extend from Rangoon. Railroad lines run from Rangoon to the north up through the center of Burma to Mandalay and Myitkyina with a side line off toward China to Lashio. The main river communication also extends from Rangoon, utilizing the Irrawaddy up to Mandalay and Myitkyina. However, since means of amphibious operation to retake Burma from the south were not available, Southeast Asia Command was forced to plan the conquest from the north. Entering Burma from the north, the railroad lines could be reached at Myitkyina and Mandalay, but railroad lines without rolling stock are of little value. Early in the campaign, the principal rivers in Burma could be reached; the Chindwin at Kalewa and the Irrawaddy at Myitkyina, but again without powered craft these rivers furnished an unsatisfactory line of communications. Before the war, no roads connected Burma with India. American forces under General Stilwell were hacking the Ledo Road across mountains and through the jungles to Myitkyina, but by the summer of 1944, this road was still several hundred miles short of Myitkyina. On the west, British engineers had earlier improved the road from Manipur Road to Imphal and had then built an extension across the mountains to Tamu. But Tamu is over 300 miles from Mandalay and nothing but tracks connected the two.

. . . Calcutta, a teeming port, was the starting point for supplies, both for British and American forces. From Calcutta, supplies were moved by rail over a broad-gauge line for over 200 miles and then transferred to a narrow gauge for another movement of 388 miles to reach Manipur Road, including transfer-across the Brahmaputra by a rail ferry. The U.S. supplies followed this same route, but continued past Manipur Road. to Tinsukia and the Ledo area. In addition, the small port of Chittagong was connected by a narrow-gauge rail with Manipur Road, a distance of over 350 miles. Major base facilities at Calcutta were ready to handle the load, and at Manipur Road the advance base was in being. Forward from Manipur Road, an all-weather macadam road was in good shape to Imphal Jap demolitions and monsoon damage had to be repaired between Imphal and Tamu. From Tamu forward, a fair-weather track ran to **Kalewa**. East of the Chindwin River lay a broad jungle-filled plain, traversed only by little-used tracks and a narrow fair-weather road to Mandalay. From Mandalay, the main road net of Burma leads to the south. Thus, in effect, the base area was prepared, even though supply was inflexible due to the distances and transshipments required. But forward of the base an almost virgin country must be crossed by an army of two corps to reach the central plain of Burma. And even then, once Mandalay was seized, the army would still be 400 miles from its goal at Rangoon.

Aside from the war against the Jap must be considered the war against the weather. In Burma, May to November is the season of rains or monsoons. While these torrential rains do not prevent operations, they break down all communication lines, making fair-weather roads impassable, interrupting all-weather roads for varying periods, and generally forcing operations to proceed at a walk. Thus, the operation must jump off in full force in December and reach its goal in Rangoon in early May in order to insure defeating the second enemy, the weather. . .

The logistical solution presented can be summed up in a few words. Use every means available to beat the monsoon. The successful efforts by the American forces to supply Chinese and American troops of the Northern Combat Area Command have been so well covered by other articles that I will cover only the logistical support of the British 14th Army. One of the principal requirements was POL (gasoline and its allied products).

A British pipeline was built from Chittagong to Manipur Road and then extended to Imphal. The road to Tamu was repaired to all-weather classification across the mountain region. One hundred miles of new all-weather road were built from Tamu to Kalewa. Because of the time element, lack of a sufficiently large number of dump trucks, and lack of good stone sources, this road was surfaced with PBS. PBS, directly translated, means prefabricated bituminized surfacing, or, as we would be more apt to know it, heavy burlap thoroughly impregnated with bitumen, brought up in rolls and laid on the prepared subgrade. This was definitely in the nature of an experiment, but it had to work, and be ready by the next wet season. In the meantime, traffic used the old dry-weather trail. Because there were not enough engineers to do this job and also bring the Kalewa-Mandalay road up to specifications, supplies forward of Kilewa would move by the Chindwin River down to the junction of the Irrawaddy to Myingyan. Only tactical vehicles belonging to divisions used the existing fair-weather road from Kalewa forward. To implement this river supply scheme, it was necessary to get floating equipment to Kalewa. The lines of communications would not handle the large tonnages of craft in addition to the essential tonnages to supply the army, so impromptu boat yards were set up at Kalewa and hundreds of various types of barges and boats were built. Engines and special fittings were brought down the long railroad and road lines of communications to complete the job, and even a few sectional tugs made the long journey. In addition to new craft built, every type of local craft available was pressed into service. POL was moved forward by making up large rafts of drums, fastening them together with a bamboo floor, and towing them down the river. Rafts for dry storing were constructed from **light** materials obtainable locally, principally bamboo, and floated one-way to Myingyan.

All of this would have been to no avail without the magnificent effort of the RAF and USAAF on air supply. It can be safely said that the Burma campaign was an air supply war. Divisions would advance fifty to a hundred miles, forward engineers would know about an air-strip, and the C-47's and 46's would land, thereby increasing the efficiency of payload over that possible by air dropping. Thus in effect, the supply was by a series of hops forward to one transport strip after another with the interval covered by air dropping. The flexibility furnished by this air supply enable operations to outflank the Japs which would have been

impracticable by any other means. When operations had succeeded in clearing portions off the railroad of the central plain, locomotives were brought forward by road and river, and some were even flown in by air.

. . . statistics [show] what was involved in this tremendous logistical task, but they cannot give the true measure of the hardships and difficulties involved. The operation was a success because the fighting troops were willing to get along without supplies normally considered essential; because when an emergency arose, air supply was able to deliver the goods on time; because thousands of troops and labor working on the often crude and elongated lines of communications kept tonnages rolling forward through every difficulty.

This solution to a difficult logistical problem is not one which others will try to follow in the future, but it is a prime example of the advantages of control of the air, of adequate air supply, and of combined efforts by every practical means to deliver sufficient supplies to the right place in time to support tactical operations. Both the British and American troops who participated can be proud of a task well done.

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25 (March



Figure 1. Horizontal Ice Ledges in the Lower Portion of a Placer Exposure

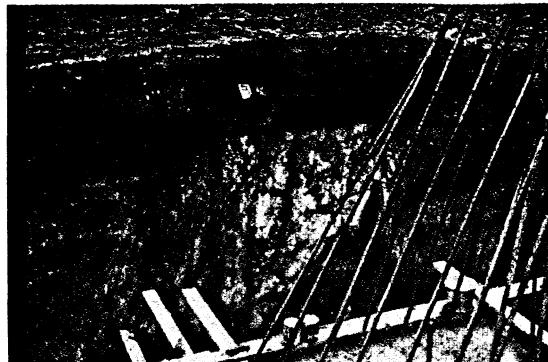


Figure 2. Concrete Foundation in Permafrost. Ice below Topsoil Layer Is Shown in Background

The Problem of Permafrost

WALTER K. WILSON, JR.

Colonel, Corps of Engineers

AN intensive study of permafrost by the Corps of Engineers, St. Paul District, under the direction of the Chief of Engineers, was started in 1945 because there had been numerous construction failures at airfields in Alaska and it was necessary to determine the best designs and construction methods for arctic and subarctic regions. The field work has included studies of airfields construction during World War II as well as an experimental plot developed at Fairbanks, Alaska for an intensive study of foundation conditions. Weather and ground temperature data are being correlated for various points in Alaska. Thermal properties of soils are being determined, and field investigations are being made to develop methods of locating the best possible airfield sites from aerial photographs. From the studies in progress, it appears that it will require several years of observations to develop design criteria and methods for construction of airfields in arctic and subarctic regions.

PROBLEMS ENCOUNTERED

Permafrost, or permanently frozen ground, is usually found in varying thicknesses below the surface of the earth in regions where the mean annual temperature is below 0 degrees Centigrade. (See Figures 1 and 2. In Figure 1, frozen peat and silt separate the ice ledges.). The permafrost phenomenon is very extensive, covering about one-fifth of the world's land area. In the northern hemisphere, permafrost is found in about 80 per cent of the area of Alaska, 50 per cent of Canada, and practically all of Siberia. Although its origin is not known, it is believed that permafrost was formed during the Ice Age. It exists as both continuous and discontinuous layers. Where it

exists as continuous layers, its thickness has been found to range up to about 1,500 feet. The permafrost is generally overlain by an active zone, of which all or the upper part freezes each winter. (See Figures 4, 5, and 6.)

It has been known for a long time that permafrost exists in the regions mentioned but its effect on construction had not been studied prior to World War II, except by the Russians who have made investigations in Siberia for many years as a result of failures of structures along the Trans-Siberian Railroad. Many of the Russian studies have been concerned with obtaining basic information relative to the factors which influence permafrost, as well as obtaining solutions to various engineering problems which have been caused by disturbing the natural regime of permafrost. Their investigations, as well as our own, indicate that important factors which influence permafrost are climate, ground water, vegetation, and soil characteristics.

American engineers were confronted with problems associated with permafrost during construction of the Alaska Highway in northern Canada and Alaska. Here the permafrost, in many places, was

only a foot or so below the ground surface. (See Figure 2.) Upon removal of the vegetation which is a natural insulator, the ground thawed rapidly and where fine-grained soil was present, serious difficulties were encountered in operating construction equipment. This problem was overcome, in some cases, by immediately backfilling the excavated area with sand and gravel to a sufficient depth to prevent further lowering of the permafrost surface and, in other cases, by constructing the road fill on the



Figure 3. Encroachment of Ice Field on Highway
Note artificial thawing of ditch and culvert

natural vegetative cover. As a by-product of permafrost, drainage ditches along the highway in cut sections frequently became filled with ice during the winter season and, in many instances, the icing would overflow the roadway to a considerable depth interfering with normal use of the highway. (See Figures 3 and 4. In Figure 3 artificial thawing of ditch and culvert should be noted.) This condition was principally

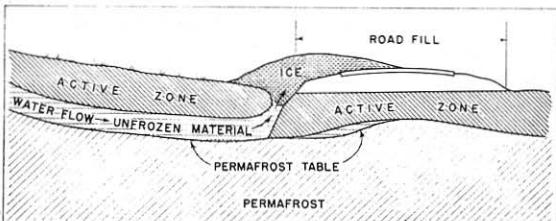


Figure 4. Uncontrolled Ice on Road

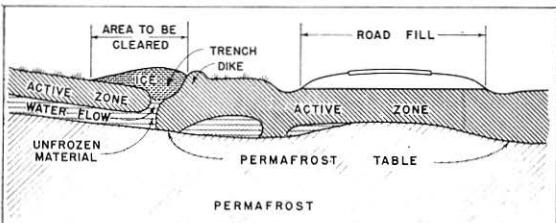


Figure 5. Method of Controlling Ice

pally caused by the seasonal freezing downward from the surface of the ground under the ditch meeting the permafrost table which forced the ground water in the hillside to break out slightly upstream from the ditch. It has been possible to overcome this difficulty to some extent by clearing the natural insulating material from a strip of land uphill from the roadway and constructing a ditch and dike perpendicular to the direction of the ground water movement to permit intercepting, conveying or storage of surface and ground water away from the road. (See Figure 5.)

The presence of permafrost also caused problems in the construction of many airfields which were built in Alaska during World War II. Problems encountered in the construction of runways were essentially the same as those encountered in highway construction. Considerable damage was caused, in some instances, where sufficient insulating material was not substituted for the natural cover which was removed and where the fine-grained frost-heaving material was not replaced by nonfrost-heaving material. As a result, the runways of certain airfields had to be reconstructed. Problems also were faced in connection with heated buildings in which conditions became progressively worse as the heat flowed into the ground over a period of time and caused the melting of the permafrost. (See Figure 6.) Where the thawed soil was fine-grained, it lost most of the stability which it had while in a frozen condition and, as a result, the buildings placed on it settled and in some cases were severely damaged.

INVESTIGATIONS IN PROGRESS

It was as a result of these failures that the investigation of airfield construction in arctic and subarctic regions was initiated by the Chief of Engineers and

assigned to the St. Paul Engineer District, in January 1945. The investigation is still in progress under the general direction of the writer. It is expected that the investigation will continue for several years. The purpose of the investigation is primarily to develop design criteria and construction methods for airfield pavements, structures, and utilities located in arctic and subarctic regions. Objectives of various phases of the investigation include:

- Study of the performance of existing airfield installations on permanently frozen ground.
- The observation and correlation of the relationship between climatic conditions and soil conditions throughout Alaska.
- The determination of the thermal properties of typical soils from Alaska by laboratory tests.
- Study of heat transfer in soils and insulating materials and applications to design of runways, roads, and buildings on permanently frozen ground.
- Review of literature in English and foreign languages on permafrost and construction thereon.
- Development of a method of identifying permafrost areas and soil types from terrain characteristics shown in aerial photographs.
- Investigation of the applicability of geophysical methods to use in the location of permafrost in localized areas.

Studies are now being made to attain the above objectives. Field forces in Alaska under the jurisdiction of the St. Paul District Engineer are comprised of engineers, soil technicians, temperature observers, core and churn drill operators, and surveyors.

For the purpose of determining the performance of existing airfield installations on permanently frozen ground, observations are presently being made at Northway Airfield, Alaska and, as new airfields are constructed in the permafrost region of Alaska, it is planned to make additional observations. The investi-

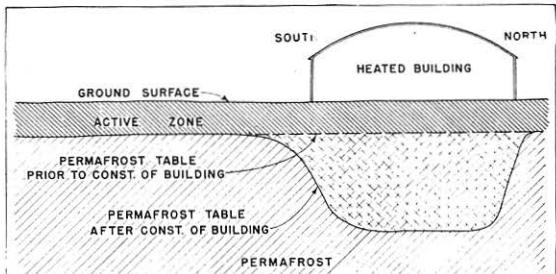


Figure 6. Effect of Heated Building on Permafrost Table

gation at the airfields includes the making of core or churn borings, with a maximum diameter of 8 inches, in the permanently frozen ground to depths of 30 to 75 feet and the installations of equipment for measuring temperatures in the boring holes at various depths below the surface. Observations of temperatures are made at regular intervals. The borings are logged and samples are tested for their physical characteristics. Ground water wells are established throughout the area and vertical movement observation points are installed along the runways and in and near structures.

From the observations made during the past two years at Northway, it is indicated that the permafrost under the runway has stabilized at a depth of about

10 feet below the surface as compared to a normal depth of about $3\frac{1}{2}$ feet in the undisturbed ground. They also indicate that the permafrost surface under the hangar is receding progressively downward until it has now reached a depth of 24 feet below the floor level. Although vertical observations indicate a maximum settlement of 1 foot on the hangar floor and abutments, no apparent failure of the structure is imminent.

The investigation of the existing and proposed airfields did not provide certain basic information concerning permafrost, nor did it provide the basic information desired concerning various other types of construction. In order to obtain this information, a research area was constructed near Fairbanks, Alaska in an area of fine-grained soil where the permafrost surface is from 3 to 4 feet below the ground surface. A description of this research area is given in the article "Permafrost Research Area" by W. Marks Jaillite in *THE MILITARY ENGINEER* for September 1947.

As a supplement to the studies at Northway Airfield and at the Research Area near Fairbanks, an investigation is being made to determine relations between climatic and ground conditions throughout the permafrost region of Alaska. For this study, ground temperature measuring equipment was installed in 20-foot deep boring holes at each of fifteen weather stations. Observations of ground temperatures as well as climatic conditions are being made at these stations and the data collected are being studied.

Tests being made at the University of Minnesota, under a contract with the Government cover the

raphy, vegetation and tree growth, as shown on aerial photographs, a technique has been developed whereby it is possible to select from the photographs, areas where construction can be successfully carried out as well as those areas which should be avoided. Figure 7 shows the pattern of ground polygons, an indication of fine-grained soil and ground ice which provide poor foundation conditions. The outlines of the polygons, as shown on Figure 7, are formed by a series of ice wedges inclosing silt or fine-grained soil areas. It has been demonstrated in the United States that studies of aerial photographs can eliminate long and extensive ground explorations where an investigation is being made to determine the most suitable site in a large area and that brief ground explorations can then confirm the selected locations.

Studies have been made to determine the feasibility of using geophysical methods for the location of permafrost. Both seismic and electrical resistivity methods have been tried and the latter method appears to have the better chance of successful application. However, the results obtained to date have not been entirely satisfactory, and it appears that further studies must be made to prove or disprove the practicability of using geophysical methods for the intended purpose.

CONCLUSIONS

It appears that it will require several years of observations in various locations and under a variety of conditions to determine thermal characteristics of permafrost areas and to develop design criteria and construction methods. Although definite conclusions can not be made at this time, there are certain trends or tentative conclusions which engineers should consider in connection with new construction in arctic and subarctic regions. These trends are based on library research and on the results of this investigation.

Site selection is very important and, wherever possible, structures should be located on coarse-grained materials where the lowering of the permafrost surface will not cause deleterious settlement of the structures.

In areas where there is danger of settlement of structures due to melting of the permafrost, a space suitable for circulation of fresh air should be provided under heated buildings to prevent the transfer of heat into the ground.

In the construction of roads and runways, no fine-grained frost-heaving soil should be permitted in the ground zone subject to seasonal frost.

Where there is danger of icing over roads, consideration should be given to cause induced icing some distance from the structure. Where possible, roads should be located to avoid side hills and incident icing problems.

Where complete information is available concerning soil characteristics and the extent of permafrost at a given site, it is possible through proper construction methods to avoid deleterious settlement of structures.



Figure 7. Aerial View of Ground Polygons

thermal conductivity and specific heat properties of certain soils, rock types, and insulating materials at various densities, moisture contents, and temperatures. As the various reports on the tests and observations are collected from the various sources, it is planned to correlate the data, evaluate the results, and produce, if possible, guides for the design and construction of airfields in permafrost areas.

The feasibility of using aerial photographs in identifying permafrost areas on the ground is being investigated by Purdue University under a contract with the Government. From a field and office study of surface characteristics such as drainage, topog-

The Corps of Engineers as a Career*

A MESSAGE TO STUDENTS CONCERNING THE DUTIES AND OPPORTUNITIES OF AN ENGINEER OFFICER

Foreword

The early history of the Military Academy and the Corps of Engineers were practically identical, for West Point long remained the home of the Corps. And as our young country developed westward, the rivers and canals became the highways to exploration and development, just as the frontier posts planned by the Corps and manned by the Army became the bastion of American empire.

Throughout the history of our Army and our country, engineering and construction have comprised an essential power to the support of military power. Moreover, since no other pursuit or profession so closely resembles and follows the basic principles of war as does engineering and construction, history very often records great engineers to be great military leaders in all our wars.

The combination of battle leadership, logistical leadership, and engineering technical leadership is not unique. Caesar and his Roman legions are just as famous for their fortifications, roads, aqueducts, and bridges as for their victories over the Helvetians and the Gauls. In fact, military history from the antiquity of Xerxes, through Napoleon, to the engineering and battle leadership of American Engineer officers today, demonstrates invariably the close relationship of military leadership and construction power. In considering the Corps of Engineers as a career, I cannot overemphasize the importance of this dual relationship and dual role of constituting both a combat arm and a military engineering mission.

SAMUEL D. STURGIS, JR.
*Lt. Gen., United States Army
Chief of Engineers*

By W. K. WILSON, JR.
Brigadier General, United States Army

AS illustrated by the SAGE BRUSH maneuver,¹ the United States must and intends to have a highly mobile Army with hard-hitting teams—which will rapidly concentrate on the objective. Then to limit hostile action, they will disperse while preparing for the next strike. Such an Army can succeed only if true leadership is active from the smallest unit to the largest. The Engineer Battalion Commander will be required repeatedly to tell his Division Commander whether or not the tactical plans can be supported. The Engineer must be certain of his position. He will need, not the slide rule certainty, but the certainty gained from a practical knowledge of what can or cannot be done, and the certainty that his company and platoon leaders will exercise ingenuity, common sense, drive, and troop leadership. The maneuver also re-emphasized that the Corps Combat Engineers are constantly working forward in the divisional areas and frequently ahead of the divisions, in river crossings, breaching minefields and, on retrograde operations, executing the last minute demolitions.

The combat mission of the Corps of Engineers is its reason for existence: to facilitate the advance of friendly troops, to impede the advance of the enemy, and to fight as infantry when required. The engineer units are organic in every division—infantry, airborne, and armor. Specifically in the forward area Combat Engineer Units ferry the advance waves in a river crossing, provide the tactical bridges for moving the forward elements, breach the hostile minefields, assist in breaching fortifications, open up and maintain the forward roads, organize the beaches in an amphibious operation, destroy bridges and facilities, lay minefields, and fight as infantry.

Behind the forward echelon, engineer functions in

*From remarks to the first class of the United States Military Academy, December 1955.
¹See "Engineers in Operation SAGE BRUSH" by Col. J. L. Lincoln on page 120 of this issue.

the Army team have increased in importance with the increased mobility of American forces and the increased potential for destruction available to the enemy. In order that troops and services can function, engineer missions of construction, rehabilitation, and operation must be carried out efficiently and promptly. Preparations must be made to counteract the hostile potential for rapid, far-reaching airborne attack by both static and active defense, counterattacking before the enemy can consolidate and while other elements of the combat team are being brought into the action.

Obviously, more true engineering can be accomplished as more time becomes available, but as the experiences in Korea and World War II have demonstrated, the requirement for a regular engineer officer is not for a highly skilled mathematician or design technician but for an officer with a background of technical training and experience who can furnish the leadership, broad vision, and Army technique necessary to produce military results with the skilled technicians brought into uniform during the emergency. There is a place in the Corps, as in all branches, for a true mathematician in such fields as electronics and atomic power, but the basic requirement for a regular engineer officer is that he understand the principles of construction and know how to lead men.

Missions of Air Force support give the Corps of Engineers in peace and in war the opportunity to broaden the experience of both officers and men. The Army itself gains from the concept of furnishing this support. It reduces duplication and competition for skilled personnel, provides more balanced peacetime training, and provides more flexibility and control to the theater commander in war. And the Air Force looks to the Army Aviation Engineer Battalions to provide the bulk of its combat effort in counteracting hostile ground action.

Because of the development of long range destructive weapons, America's survival may depend on her ability to maintain a "going concern" at home. The Corps of Engineers must be prepared to direct the efforts of rehabilitation in support of the war effort, without materially lessening its support of the Army and Air Force.

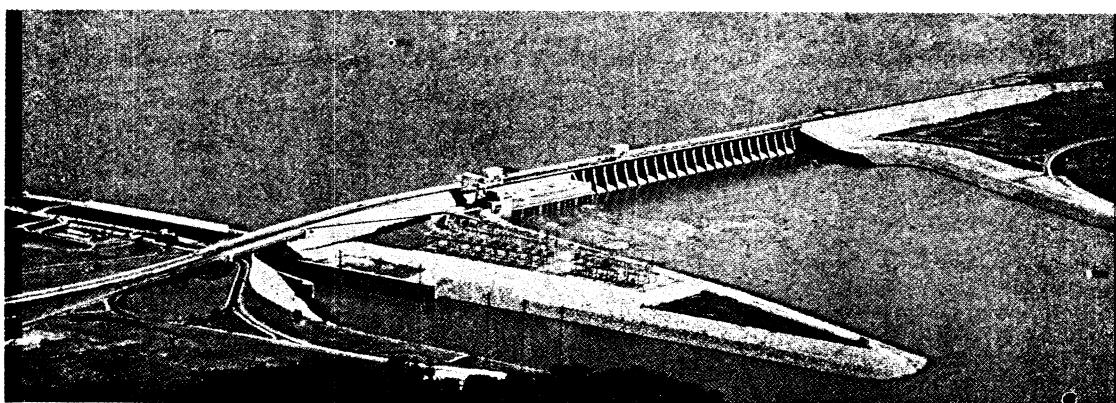
The successful accomplishment of these wartime

missions calls for training expenditures in peacetime far beyond the financial capabilities of military appropriations. About all that available training funds provide for are individual training of the officer and enlisted man, and small unit training. Limited construction training can be added by assignment of construction jobs financed from new construction appropriations, particularly in off-shore locations, but the major source of peacetime construction training comes from the second national mission of the Corps—civil works.

IMPORTANCE OF CIVIL WORKS EXPERIENCE

Engineers of no other Army have such an opportunity and this unique mission has contributed materially to the proven ability of the Corps of Engineers to perform its function in the Army team. The normal construction struggle with men, materials, equipment, terrain, weather, and floods brings the engineer officer on civil works duty much closer to facing the conditions that confront a combat officer in war and to exercising his leadership than any other peacetime activity.

The construction organization of the Corps of Engineers is divided into thirteen Divisions reporting to the Chief of Engineers, each with several Districts. The Districts are the engineering and construction agencies, and if located in an industrial center, an additional mission of procurement is assigned. The District is normally charged with both civil works—improvement of waterways for navigation, flood control, and power—and military construction such as barracks, messes, schools, warehouses, airfields, industrial plants, and facilities for research and training—in short, all major construction for the Army and Air Force. The Engineer District plans the development of water resources of an entire region or develops the construction necessary to satisfy the requirements of a using service. It carries these projects through the preliminary stages, to detailed design and ultimately to completion of construction. This involves all types of skills—engineering, construction, legal, real estate, comptroller, administration, public relations, and personnel and job management. It requires staff planning and execution, co-ordination with higher headquarters, with the using service, with local interests, and with Congressional delegations. It often requires reinforcement of the district engineering staff



Kentucky Dam Constructed by the Corps of Engineers on the Tennessee River in Kentucky

by contracting with leading architect-engineer firms, and it normally requires contracting with construction contractors.

This construction organization provides several advantages to the Army. It gives an opportunity for engineer officers to plan and manage major projects in peacetime and develop and utilize their leadership potential. It gives these engineer officers an acquaintance with the methods and with many of the personnel in American engineering and construction industry, and it provides, in being, a large efficient organization which can be expanded and called upon to perform a major share of the missions of the Corps of Engineers in wartime. At the start of World War II and the Korean War, it was possible, without loss of time, to divert the efforts of this organization from its peacetime projects to the suddenly expanded military requirements at home, as well as to take from it technicians and management personnel required to establish major construction organizations in some of the off-shore locations.

The potential of this nation-wide organization will undoubtedly be utilized in a war of the future, not only to prepare the home base for prosecution of the war, but also to counteract at home the effects of the destructive power which an enemy may use. Even this requirement is practiced, in that the Corps of Engineers is called upon to combat floods, hurricanes, and other national disasters.² Thus this military-civilian construction organization is available in emergencies both in peace and in war; and, from its experience in peacetime, can develop the background which will better enable it to tackle its wartime duties.

Although of extreme importance in giving engineer officers an opportunity for practical experience in a major program, civil works involve only a relatively small element of engineer officer strength at any one time to control the fifty thousand civilian employees permanently in the organization. The bulk of the officers are in troop assignments, principally Engineer combat and combat support units. There are 5 per cent on construction; about 3½ per cent on supply and procurement; 5½ per cent on miscellaneous assignments; and 10 per cent as students. An approximately equal number, 22 per cent, is on military headquarters staffs. Troop units and direct troops support involve more than all of these assignments, or 54 per cent.

TYPICAL EXPERIENCE

The typical career of an officer currently joining the Corps of Engineers begins with the branch school at Fort Belvoir which specializes in engineer troop officer training. Then he may expect to go to an engineer unit, probably a combat or construction battalion. He can expect, within a couple of years, to have been a company commander, with the opportunities, responsibility, and experience involved. He will be dealing largely with a draft Army, most of whom want to get out as soon as they can. The opportunities for leadership will be unlimited. Both the officer and enlisted personnel have the inherent capabilities that are necessary to make a good organization and require only adequate leadership to develop. After several years of troop duty, the officer can expect to start another round of schools. Within his first dozen years of service, he can expect at least a

short district tour on major construction, as well as additional Army schools, troop duty, staff duty, and perhaps a tour as an instructor.

On his first tour in the District, he will have an opportunity to make use of some of his technical training and all of his organizational and leadership training. He will find that the requisites for topnotch officers on these assignments are essentially the same as the requisites for topnotch officers in a troop assignment. He will have an opportunity to work with skilled civilian engineers; and to observe those attributes and techniques which make for a successful job. Normally, he will be responsible for some phase of a construction project, where he will be able to exercise leadership and to observe the methods of the contractors and evaluate these methods in order to determine the way he will handle a similar job when the opportunity offers.

An officer in this position should learn more in a short period of time than the average college graduate in civil life will learn in the first ten years of his experience.

After the first fifteen years, the officer may expect at least two more opportunities for important troop commands; opportunities for logistical experience and, at least one opportunity for a position at the top in either a District or Division organization. In the job as a district engineer, he will be able to put to use what he has learned in management of people, in leadership, and in technical skills. He will learn much from public relations dealings with local interests, with the contractor's management, and with the Congressional delegations in his area. In troop command assignments, he will find it necessary to get up to date on the latest changes in equipment and technique and organization in the Army, but once again he will find that the principles learned in handling people and in making an organization function effectively will be of greatest value.

While a national emergency will undoubtedly disrupt forecasting, he will have excellent opportunities for advancement to general officer grade. For example, taking the Military Academy classes of 1922 through 1932, a higher percentage of graduates who selected the Corps of Engineers as basic branch have become generals than the remainder of their Army classmates, who joined other arms and services.

OPORTUNITIES

It is believed that officers of the Corps of Engineers are exceedingly fortunate in the opportunities for variety of service, for command assignment in the field officer and higher grades, and for having the satisfaction of watching results grow in concrete form.

In conclusion, it is well to remember that each branches the officer will have to overcome these obstacles of initiative, ambition, and leadership. Every branch has its hardships, trivia, and its routine. In all the branches, the officer will have to overcome these obstacles and rise above them. If he can do so, the Corps of Engineers offers, to those who choose its service, the highest type of opportunities for military service and command. And, in addition to the military opportunities, service in the Corps offers professional training which can be a springboard to important civilian assignments when active service in the Army comes to an end.

²See "Operation NOAH" by Brig. Gen. Robert J. Fleming and Col. Clarence Renshaw [M.E. Nov.-Dec. 1955].

Overseas Military Construction

By W. K. WILSON, JR.

Major General, United States Army
Deputy Chief of Engineers for Construction

THE mission of the Army has always been success in battle, and combat support remains the primary mission of the Corps of Engineers. But in recent years increasing emphasis has been placed on the provision that the preparations, so necessary to insure this success in battle, also provide the best deterrent to war.

The principal factors in insuring combat success are the soldiers, sailors, marines, and airmen, properly trained and mentally prepared to do their jobs. To potential enemies, however, the most effective deterrents are the visible forces—men and powerful modern weapons, ready and able to deliver a knockout blow if attacked. The American overseas Army and Air Force bases throughout the free world constitute a major part of such visible deterrents. The construction of these bases overseas is a mission of the Corps of Engineers.

The technical service missions of the Corps are to supply engineer materials, to acquire and manage real estate, to maintain Army installations, to conduct research and development, and to perform military construction. The overseas military construction of the Corps of Engineers today comprises bases for the Army, Air Force, and in some cases, for the Navy, and for friendly foreign governments in 23 countries: to the east in Pakistan¹, Iran, Saudi Arabia, North Africa, and countries in Europe²; to the west in Japan, Korea, Okinawa, Hawaii, and Taiwan; to the south in the Caribbean area; and to the north in Greenland, Iceland, and Canada. These bases are evidence that the United States is ready and able to defend the peace. They provide great encouragement and moral support to the nations of the free world.

TRANSITION FROM WAR TO PEACE

The military construction overseas also provides improved living conditions for military personnel stationed abroad. Twice since 1940 the United States has gone from peace to war, and back to a "cold war," in which the present semi-permanent overseas garrisons are maintained. Each time, at the conclusion of

hostilities, soldiers have been left in scattered overseas locations, usually with inadequate barracks, little or no facilities for health and recreation, and without family accommodations. This situation has required the entire overseas command to make a transition from war to a peacetime status—from a force poised for success in battle at any personal cost, to an economical yet adequate peacetime establishment with facilities for military preparedness and proper living conditions.

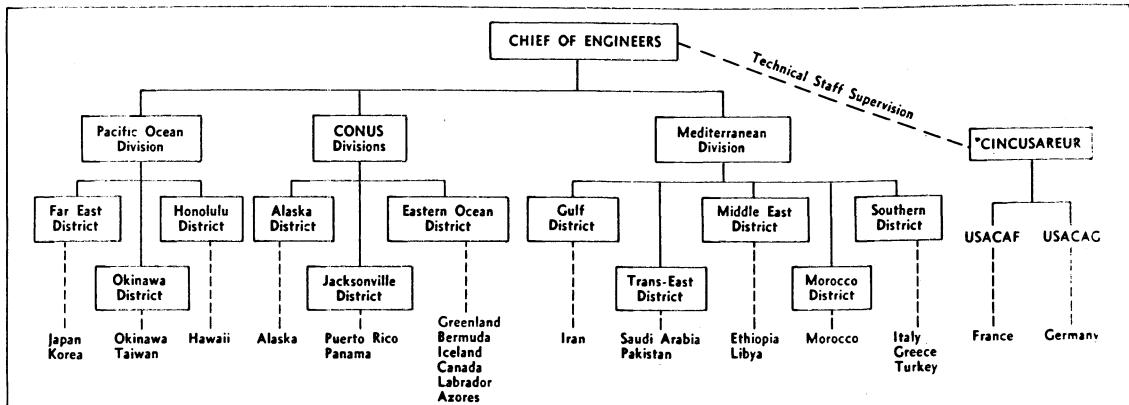
In Germany, Italy, Japan, and Okinawa this transition period began in 1945, with the troops in battle positions, at the end of hostilities in World War II; it began in France in 1950, when American troops arrived to establish the Line of Communications under international agreements; and in Italy in 1955 when American forces were returned to strengthen the Italian forces. In all these areas, although work is still continuing, much has been accomplished toward providing military preparedness and adequate living conditions.

In Korea the transition began with the end of hostilities in 1953. At that time, nearly all American troops were living in tent camps under field conditions. Units were scattered as demanded by the military situation, and the Korean Government and people had little or nothing in the way of facilities which could be shared. During 1954, efforts were limited to improving the tent camps and providing the basic essentials. Since the engineer effort had to be channeled into the construction of operational and logistical facilities rather than living quarters, the tent camps were improved mostly by the men themselves, with whatever assistance the engineer troop units could give. In 1955, a program was successfully launched to provide quonset huts for living quarters. Then, in July 1956, a large-scale contract construction program was initiated to provide the necessary troop support facilities, comprising water supply, mess halls, electric power, latrines and showers, and laundry services, all on a semi-permanent basis. Subsequent programs provide for the continuation and expansion of these support facilities.

Such a transition from war to peace also requires a transition in engineer construction methods and organizations. In war, construction of logistical facil-

¹See "Pakistan: Newest Construction Area," by Col. Robert E. Snetzer, page 335 in this issue.

²See "Engineers in USAREUR Today," by Col. J. E. Walsh, on page 331 in this issue.



Organization for Military Construction Overseas

ties in overseas rear areas is done almost entirely by engineer troops. At the end of hostilities, the organization, equipment, and personnel of these units must be adapted to the peacetime construction; and there are never enough units! As the transition progresses, the engineer units are usually strengthened by locally-hired civilian employees. The next step calls for employment, on a small scale, of civilian contractors, usually under unit supervision and management. Finally, in order to carry out a major construction program effectively and economically, an Engineer Contract Construction Organization is established. In addition to increasing the efficiency and control of construction management, this step also frees the engineer troop units for training in their basic combat mission. The construction transition has now progressed through this last step in all major overseas areas, Korea being the last, with the establishment of the Korea Construction Agency in 1956.

Since 1950, overseas military construction under cognizance of the Chief of Engineers has totalled over \$4 billion, approximately one-third of the total military construction work during that period. When one adds to this volume the problems inherent in language differences, various national customs and construction methods, and foreign governmental policies and procedures, an appreciation of the scope of the program may be gained.

DEVELOPMENT OF CONSTRUCTION ORGANIZATION

Since 1824 the divisions and districts of the Corps of Engineers have conducted an engineer construction mission in the United States known as Civil Works, which comprises the improvement and maintenance of rivers and harbors for navigation and flood control, and the provision of multiple purpose facilities. Prior to World War II, military construction of post facilities was a responsibility of the Constructing Quartermaster, with fortification work being done by the Corps of Engineers.

Just prior to the entry of the United States into World War II, all Army military construction was made the responsibility of the Corps of Engineers. When the need for overseas contract construction became apparent, the engineer divisions and districts, well established, organized, and trained through their long and varied experience in their dual civil-military role in the United States, served as a guide for the

establishment of the overseas construction agencies.

After World War II and with the advent of the "cold war," the construction programs in the Far East and Europe were executed by "Construction Commanders," with the Chief of Engineers exercising technical staff supervision only. The construction commander in the Far East was the commanding general, Army Forces Far East and Eighth Army, with construction outside Korea actually supervised by agencies similar to the engineer districts. In Korea supervision was by troop units. In Europe, the American commander in chief was construction commander, with actual construction carried out by the commands in Germany and England and elsewhere by the Joint Construction Agency, which, with its districts, was similar to an engineer division in the United States.

Last year, as the overseas construction program began to taper off, it became apparent that certain economies could be achieved by revamping the construction organizations both in Europe and the Far East. The situations were studied and plans were made which culminated in the present construction organization in those areas. This reorganization accomplished three things:

First, the Chief of Engineers was assigned the responsibility for military construction in the Pacific-Far East area. A new division, the Pacific Ocean Division, with three districts was created with headquarters in Honolulu. The Okinawa District, responsible for construction in Okinawa and Taiwan, was taken over as one of them. A new district was organized with offices in Honolulu, responsible for construction in the Hawaiian Islands and Johnston Island. The Far East District in Seoul was made responsible for Korea and the remaining work in Japan. In some of these countries, the Corps of Engineers executes military construction for the Air Force and Navy as well as the Army.

Secondly, construction responsibility for all three services in Italy, Greece, and Turkey was transferred to the Chief of Engineers; the Southern District, with headquarters in Leghorn, Italy, was transferred from the Joint Construction Agency and placed under command of the Mediterranean Division. The Mediterranean Division, which moved its headquarters from Morocco to Leghorn, also commands the Middle East, Morocco, Trans-East, and Gulf Districts.

Third, in France, Germany, and Great Britain, where construction for the United States Military Forces is actually contracted for by the host governments, the United States Army Construction Agency, France (USACAF),³ and the United States Army Construction Agency, Germany (USACAG), have been established, under the commander in chief, United States Army, Europe (USAREUR), to execute the construction in those countries for all three services⁴, while the Third Air Force, acting for all three services, continues to place construction contracts in England with the British Government.

It may be seen that there is an important and basic difference between the duties of the Corps of Engineers and those of the other technical services. In their overseas responsibilities, only the Corps of Engineers has to move its operational force to the overseas area, set up its basic accommodations, and perform such a large-scale mission at the site. Often the Corps cannot manufacture or collect materials in the United

States and fulfill its purpose by shipment to the sites. And often the construction must be done in the most primitive areas under the most adverse weather conditions, and in a limited time. For example, at Thule, Greenland, a remote snow-and ice-covered Arctic site, the minimum operational portion of this major air base was completed within four months after construction was started.

FUTURE NEEDS

Present indications are that progress in the technology of war will increase rather than decrease the logistical requirements for construction. The development of ballistic missiles, atomic explosives, and the means of defense against them, as well as the new political-military programs such as Mutual Security, creates new challenges to the military engineer in his construction mission. The increased requirements must be met with additional and widely dispersed installations, increased efficiency of construction operations, maximum use of indigenous construction capabilities, and the development of new construction methods, materials, and equipment in co-operation with the construction industry.

³See "Construction Progress in France," by James S. Arrigona, on page 333 in this issue.

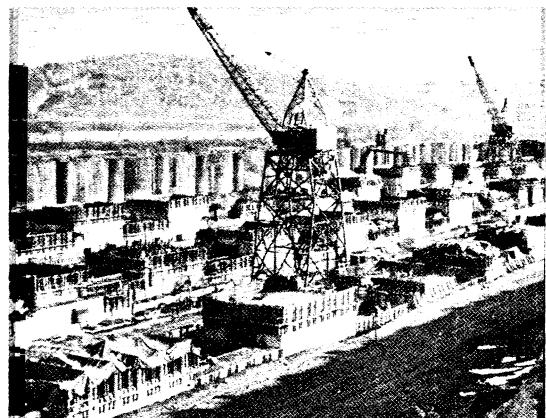
⁴Described in articles immediately following.

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The Military Engineer as Engineer-Manager

By LT. GEN. WALTER K. WILSON, JR.

Chief of Engineers, United States Army



Concrete Work at Belleville Locks, Ohio River

DURING the past decade, military engineers have been challenged by larger and more complex projects than in all the history of the profession. High among them were the design and construction of the first missile pads at Cape Kennedy (then Cape Canaveral) and at Vandenberg Air Force Base, the rocket test stands at Huntsville, the Zeus facilities at White Sands and in the Pacific, and the first operational ICBM launchers on the western plains.

Not so many years ago, the engineer's role in the military was comparatively simple. The military engineer was mainly concerned with the attainment of military objectives in the combat areas. His work had little connection with the technology that influenced economic or scientific progress. Specifications for construction work by the Army Corps of Engineers in 1875, typical of the time, read:

To be constructed of flat rubble stone walls in the lime mortar. Rough plastered inside. Main roof timbers dressed and chamfered on corners for trusses. Rest of roof sawed, not dressed. Timbers oiled. Remainder whitewashed. Windows to have rubble arched heads . . . stone quarried and erected with lime burned at Sill by extra duty labor.

By comparison, here is a sample of what an engineer supervising construction on an ICBM base has to contend with today:

Liquid oxygen and liquid nitrogen systems shall be judged clean when the particle size does not exceed 150 microns; total solids picked up in a component shall not exceed 75 ppm by weight after evaporation and the total hydrocarbons shall not exceed 75 ppm, including no more than 2 ppm polyacetylenes.

INCREASED DEMANDS

Military engineers today, exemplified by members of The Society of American Military Engineers—in uniform, civil service, and private practice—must know much more than those of a decade ago. For more than a generation, military requirements have forced great technical advances which in turn have been of great value in the over-all development of the civilian community. The military aircraft, with its increased speed, range, firepower, and weight, is a noteworthy example. In rapid succession came radar, atomic power, and the guided missile.

The demands upon the military engineer consequently increased. Today, he is deeply engrossed with his civilian counterparts in many problems ranging from the use of satellites for collecting geodetic data to the use of sonic pile-driving equipment. Except in

the primary mission in direct support of military ground combat forces, the line that distinguishes most military engineers from those who practice engineering in civilian life—especially in the field of construction and civil engineering—is very fine. In many cases, their efforts have been completely merged as private engineering firms and military engineers work together to get the jobs done.

The diversity of the military engineering profession is growing, particularly in the activities essential to land, air, and sea operations. One such essential activity is military construction, most of it not on the battlefields or in the communications zones or anywhere near them. For example, the big Strategic Air Command bases are thousands of miles from their potential targets. There are the Ballistic Missile Early Warning Systems, and the DEW Line stations guarding the Arctic approaches to the continent, and across the country the ICBM launcher bases. Almost every type of structure is needed—navigation aids, naval bases, air bases, flood protection and other water resources works, training facilities, research, development, and testing laboratories for materials, instruments, and weapons systems, and a variety of equipment and supply facilities. And in addition, the military engineer is being called upon to help to engineer and build a way to the moon and to conduct studies that will enable lunar explorers to collect useful scientific data and information.

TEAM CO-ORDINATOR

As new goals emerge, there is increasing complexity in the tasks, requiring diversified knowledge and skills not found in any single group of engineering specialists. Many of these tasks are so large, so intricate, and so demanding of technological knowledge that they can be conducted only by teams of specialists from the various technologies working closely together under a single co-ordinator or engineer-manager.

In these team tasks the military engineer is finding that his training and experience fits him ideally for the engineering manager role. It can be seen in the Army Corps of Engineers organization and among its contractors how the military engineer is being cast more and more into the role of a manager for deploying large groups of specialists required for major projects. This demand is adding greatly to his responsibility—to what he has to know and to what he is able to do. As the engineer-manager he is the "key" man in the new engineering system. The engineer-manager is an accepted role in the missile and

space programs and in water resources development.

Many of the most capable engineers in the military services are lending their efforts to the NASA manned lunar landing program (Apollo). Some are engaged in developing the long-range rocket engines that will push vehicles into space, while others are designing and constructing the ground support facilities for the testing and operational phases of project Apollo.

The bulk of the current space program is being conducted at four centers: the spaceport at Cape Kennedy; the new Manned Spacecraft Center at Houston, Texas; the Mississippi Test Operations Center near New Orleans; and the Marshall Space Flight Center at Huntsville, Alabama.

The biggest part of the space job is Saturn Complex 39, the launching base at Cape Kennedy. This will be the largest single space project ever constructed. The engineers have started construction on one of its elements, the vertical assembly building, 690 feet long, 510 feet wide, and 524 feet tall. It will have room for four, later six, 350-foot space vehicles to be erected and checked out simultaneously. The doors will be 450 feet high, and require the design of special mechanisms to open and close them. This building, erected on piles driven some 160 feet to bedrock, is being designed to withstand a hurricane. Other facilities undreamed of a generation ago are booster test stands at the Mississippi Test Operations Center being built to hold down engines capable of developing 7,500,000 pounds of thrust, and at the Houston Center, revolving laboratories for training the crews, and installations to simulate on earth the conditions found in space and on the moon. The largest environmental test facility will enable NASA to subject the Apollo spacecraft to a near vacuum, solar radiation, and temperatures ranging from 320 degrees below zero Fahrenheit to 260 degrees above. One of the laboratories, a high centrifuge, will revolve at various speeds to simulate the conditions of gravity

and flight mechanics which an astronaut may encounter in space.

Nearly every vocation in engineering has a place on the space construction team along with some other technological specialties probably not yet in existence. The construction engineer is the team captain on these big projects.

The teamwork concept is also employed in the Corps water resources program. An enormous number and variety of engineering and technological skills are required in these operations. Planning for integrated river basin development not only requires engineers, hydrologists, geologists, and economists on the team, but also other professionals such as archaeologists and biologists. Again, the role of team coordinator falls to the military engineer.

The military engineer is not only expected to manage the widely assorted construction and maintenance tasks of the Armed Forces, but also he is often asked to manage projects in other Government programs.

MANAGEMENT METHODS

Efforts are being made to fulfill this role by using the best management tools available, by using systems that permit planning and scheduling on projects so that the right material is in the right place at the right time, and so that the status of a project can be known at any time.

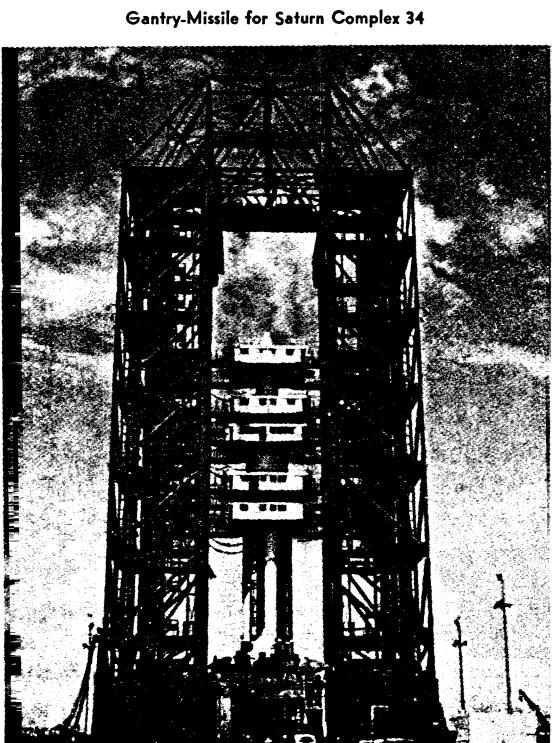
The military engineers are abreast of the profession in the use of modern management methods. They have been using computers for years in compiling mapping data, predicting floods, establishing supply needs, and for a variety of other tasks. They are familiar with the currently available systems that enable the engineer to lay out an entire construction job and then schedule its phases by an electronic computer.

For example, the Critical Path Method (CPM)¹ is being used in scheduling construction for the development of the Arkansas River Basin. CPM is one of the several relatively new systems for maintaining positive controls in dealing with the problems of construction sequences, schedules, and costs. These systems take the guesswork out of scheduling. The engineer-manager bases his scheduling for a project on various sets of circumstances and data that are programmed into a computer, which digests the whole plan and produces a realistic timetable. If conditions or circumstances change, the manager can evaluate these changes and readjust his schedule accordingly.

Military engineers must be the proponents of better engineering management. They must continue to seek better systems, better ways of analyzing and evaluating, and more ways of utilizing modern equipment. As engineers, they should welcome these responsibilities. They must stimulate confidence in the ability of engineers to get the job done—wherever it is and whatever it is. Through them the stature of the engineer may be enhanced. They must employ the most modern management techniques so that assigned jobs can be accomplished in a competent, economical, and efficient manner.

The ability of the United States to maintain a strong defense and a high standard of living, while helping other nations to keep their freedom, may depend upon the manner in which military engineers perform the duties assigned to them.

¹See "Construction Scheduling with CPM," by Capt. Richard S. Kem [M.E. Nov.-Dec. 1962].



Vision, Vigor, and Victory on the Arkansas

A Speech Before the Arkansas Basin Development Association Little Rock, December 11, 1961

To begin my remarks by saying anything but "thank you" would be most unappreciative of the welcome you have given me. I know that some of you have come long distances to be here tonight. Your presence reflects the interest and drive behind the development of the Arkansas River Valley.

Soon after I became Chief of Engineers, somebody asked me if I was familiar with the Arkansas Basin Project. I replied that I was quite aware of it. It's like my golf handicap. It's big, its important, and I get reminded of it regularly. Some of you in this room see to that.

At the risk of having your chamber of commerce bill me for membership dues, I must remark that the future of the Arkansas Valley is exceedingly bright. With our country entering a period of phenomenal growth, it seems logical that this valley is an ideal place for economic expansion of all kinds. It is rich in resources, abundant in economic opportunity, and is well on its way with river basin development to support the kind of life we cherish in this country.

With 1970 as the date for expedited completion of the Arkansas Basin Project, a challenging pace has been set for this development. To help make this possible you have mobilized two human qualities essential to real progress of any basin. These are vision and vigor of the kind that built this nation. Hold on to them, and your Valley will blossom as few others have done.

One of the best descriptions of the vision that foresaw the possibilities of developing the Arkansas is a book published not long ago titled LAND, WOOD AND WATER> I believe the author comes from the Oklahoma part of the Valley, but it is good reading in Arkansas, or anywhere else where people want to move ahead. That book tells of the long struggle to convince the doubters and the apathetic - though it is hard for me to realize there were ever any of them down here- that something could be done to make the vision a reality. Bulldog persistence and the united drive triggered by the disastrous 1943 flood which paved the way for authorization of the multiple purpose plan for the valley are all a part of the story.

These things are familiar to you, but I feel they should be mentioned. For they reflect the enthusiasm and the faith you hold for the future of your valley, and your Willingness to put out the effort and investment to realize its destiny. This is vitally important to our ability to speed construction of the engineering works to conserve the waters of the Arkansas River system and put them to beneficial use.

That the multiple purpose plan is moving fast is only partly evident when you fly over the valley. For you do not see the extensive planning and other hard work that had to be done before the first earth could be moved. But a few routine facts will serve to measure progress.

The more than \$80 million appropriation this year will bring the bank stabilization and channel rectification work to about 40 percent completion. It will advance Dardanelle Dam to about 30 percent completion. Oologah is almost finished. Keystone and Eufaula will be well over half complete - where complex relocation problems have been solved and for which the State of Oklahoma deserves great credit for its cooperation on highway betterment.

Last year recognition was won for bank stabilization as an integral part of the over-all plan - not just an emergency patchwork where the river was doing the greatest damage. This year a vital step was taken with the appropriation of initial design funds for navigation locks and dams.

In step with the timetable for completion of the Arkansas River Waterway are the terminal and transfer facilities being planned along the route. In the State of Arkansas, Little Rock, Pine Bluff, Van Buren and Gillett have created port authorities, and other communities are making plans to do so. In Oklahoma, Muskogee has organized its Port Commission and Tulsa is moving on such a project now, as are other cities.

This is foresight. This is drive. There will be great opportunities in the areas close to the waterway, but its effects will not end there. It will be felt hundreds of miles away. The commerce that will move to market by water transportation will not come from just the immediate area, nor will the incoming goods stop at the river bank.

When the first towboat whistles are heard, as sections of the waterway are opened to commerce, there is evidence

that you mean to be ready for business. And I am confident that in the meantime you will have gone out and gotten it and that new plants and business houses will be firing up their production lines and opening their doors with great frequency.

Not only the Arkansas, but the White and the Ouachita basins are headed for better things because of their navigation possibilities. Barge service has been reopened on the Lower White River recently, where channel maintenance has been resumed. Further improvement of the channel on the Ouachita has been authorized. These neighboring developments will be complementary to the economic rise of this great section of the United States.

Once your Arkansas waterway is opened, you will becomea part of an extensive industrial complex served by barge transportation throughout the Greater Mississippi Valley, which is growing by leaps and bounds. Your interests of course, will be served by the health and vigor of the entire system. One of the significant trends in waterway development is recognition by the respective areas along them that the bigger the whole pie becomes the more each particular community will have to enjoy. In the united effort of all concerned we gain great strength to push forward vigorously with waterway improvement in all areas.

Great as our progress with waterway development is, we have seen only the beginning of the significance of barge transportation to national advancement. It is interesting to note that we have recently found the waterways to be essential even to the Race for Space. The National Aeronautics and Space Agency, in asking the Corps of Engineers to build their new facilities for developing, testing and launching Space Rockets have emphasized the necessity of locating these facilities on the waterways. For the huge rockets exploring Space will be much too large for practicable and economical transportation by any other means than barge. Linking the various research, production, testing and launching facilities together by waterways will enable the huge boosters to be moved from point to point as required.

Much has been said about the effects of water transportation, and about other benefits that will flow from the development of the Arkansas. However, I want to emphasize the importance of making full use of recreational opportunities. These, of course, occur on the reservoirs, and are inherent in the slack water pools between the locks and dams. You can visualize a continuous water surface 450 miles long - a fabulous

addition to the present attraction the Arkansas Valley holds for recreational use by large numbers of people. Andt I might add, for the economic benefit of those who invest in facilities and services to enable the broad enjoyment of this valuable resource.

I am mindful of the accomplishments already in being and am confident you are not overlooking further progress of this kind. Certainly, the Corps of Engineers desires to work as closely as we can with respect to the recreational and fish and wildlife aspects of river development, as well as in other fields of activity.

I want to stress, too, the importance of looking ahead with investigations of future projects to be authorized and built along our way towards the ultimate full use of the waters of this basin. We have many surveys in various stages of progress for new or improved developments in Arkansas, Oklahoma and Kansas. We must push along with them, in addition to the construction of works now under way, or authorized. For they, too, are essential to your future.

Time will not permit me to discuss them here, but I do want to point out one of special significance- the study for possible control of salt pollution of the Arkansas and Red Rivers. The Public Health Service, as you are aware, has done an outstanding job in locating the sources of contamination. Now we need to ascertain the best methods of control and what they will cost. The control of salt contamination would provide water quality in Keystone reservoir and in the Arkansas acceptable to Public Health Service standards for domestic use, and acceptable for industrial and agricultural purposes. A feasible way to do it must be found.

We have a double objective on the Arkansas. One is to plan and build towards the full, comprehensive utilization of your water resources. The other is to use such development as a means of supporting President Kennedy's desire to accelerate the national economic growth rate.

The reasons are compelling. As the President stated in his Natural Resources Message to the Congress last February, wise investments in resources development programs today will return vast dividends tomorrow; whereas opportunities to carry out such developments may be lost forever if we fail to act now.

Further, the Senate Select Committee on National Water Resources and the Senate Appropriations Committee have both recently stressed the need to expand and expedite water resources development.

I am confident that the growth potential of this country can absorb the best efforts all of us can make to these ends. It requires that we apply these efforts wisely and unremittingly to achieve the dynamic progress of which we are capable.

It has become necessary that the planning and construction of projects and systems of projects be comprehensive in scope, extremely far-sighted in depth, and a cooperative undertaking among all groups and organizations concerned, public and private. The perspective of all persons engaged must be broadened, procedures sharpened and efforts intensified.

The Corps of Engineers approaches its part in these tasks with keen interest and confidence, and a sense of opportunity. We are reshaping our efforts along lines that will enhance its responsiveness to current and long range needs. One of the steps I have taken is to direct that water resources development be employed as an effective tool to stimulate economic growth. Another is to take into account the full, realistic life of water resources structures in determining their justification; and not to stop at an arbitrary 50-year life.

We are seeking new ways to bring all project values into focus when they are significant to the need and the justification of a development plan. Some values are difficult to measure in cold dollars and cents but nevertheless they must be taken into account if we are to make the best use of opportunities to stimulate economic advancement.

I want to stress that it is my intention that the work of the Corps of Engineers be as responsive to your needs and aspirations as men can make it, both in your own interest and to the benefit of the entire country. For the progress of water resources development in your Valley is a matter of major national importance.

In closing, I want to stress that it is extremely gratifying to work with you towards the fullest realization of the great potentials of the Arkansas River Basin, and your ambitions to capitalize upon them.

I thank you.

Water Resources Development and National Defense

A Speech Before the National Rivers and Harbors Congress Washington, D.C., May 18, 1962

You have dealt generously in giving me this opportunity to talk about water-resources development and national defense. It is a happy occasion when a man gets a chance to expound in public *on his favorite subject. National defense has been my career since entering the U.S. Military Academy and water resources have occupied a large share of my time since entering the Corps of Engineers upon graduation.

One soon learns, in the Corps, that water development and defense are two sides of the same coin. The nation's military strength is inseparable from its economic strength; its economic strength in turn depends upon the wise use of natural resources; and among natural resources, the conservation and control of water are absolutely basic.

Thus broadening and acceleration of water development of all kinds becomes a matter of primary national importance, which President Kennedy has stressed twice in his Messages to the Congress during the past two years.

What this country needs now, and needs badly, is fuller realization of the great scope and size of the water-resources development task confronting it, and an absorbing dedication to an all-out generation-long, water development effort.

How big is this task? I am going to cite some figures, derived in part from studies inspired by our work with the Senate Select Committee on National Water Resources a couple of years ago. I shall put them forward very tentatively, because of looking far ahead as we have to do in planning large-scale construction programs--the estimates of needs must necessarily be very rough.

Resources for the Future, Inc., made a monumental study for the Select Committee which indicates the magnitude of the reservoir storage capacity we shall need just to keep the rivers flowing adequately to meet all demands for water. The Corps of Engineers has completed the picture by taking into account a nationwide inventory of additional needs. The outstanding conclusion reached by combining the results of the two studies is that by 1980 - only 18 years from now - the nation will need to

add more than 400 million acre-feet of reservoir capacity to its existing systems. This is two and one-half times the capacity of all the reservoirs the Corps of Engineers has built in the past - mainly in the last two decades. And it somewhat exceeds the aggregate capacity of all reservoirs that have been built in the United States since its beginning.

And this is only the basic part of the job - necessary to provide the high degree of conservation of water and control of streamflow to assure dependable supply for such requirements as domestic and industrial use and to maintain satisfactory stream conditions generally. Add to it the navigation improvements, local flood protection works, hydro-electric power, recreation and other related tasks of comprehensive development and the over-all undertaking looms quite large.

When we in the Corps of Engineers try to size up our projected part of the task we find ourselves contemplating programs in the next two decades ranging from \$1-1/2 billion to \$2-1/2 billion a year for new construction alone.

Figures like these are startling. But when we look realistically at our national future, the scale of the projected development to meet water needs falls into proportion. The United States faces a big future--big in every aspect--big in strength, big in accomplishments, and therefore big in its needs.

To meet these needs, as we see them now, would require a Corps program growing at a rate of about 6 percent each year. As a national goal is an annual growth rate of at least 4.5 percent for the Gross National Product, and as attainment of this goal depends upon prior development of basic natural resources, a growth rate of at least 6 percent in developmental programs appears entirely reasonable. Moreover, we have some catching up to do in the development of water resources.

We have made an analysis of how the demands projected by various authorities for the Senate Select Committee would, in all probability, affect those parts of the over-all water resources responsibility to which the Corps of Engineers' efforts are normally directed. Our concern has been to ascertain where we have to raise our sights, how we need to sharpen our procedures, and in general, line our work so as to make headway towards helping meet future requirements.

I might add that we were interested in finding out where any bottlenecks might be encountered, so we might take early action in an effort to avoid them.

Beginning with the reservoirs, let me pass along to you some of the facts our analysis revealed. The Senate Select Committee's report indicated that a total of well over 300 million acre feet **of** reservoir storage space would be needed by 1980. This storage was projected just for regulation of the nation's rivers to increase low water flows for purposes such as water supply, water quality control, power, navigation, recreation and the like. Additional storage reserves for flood control, most of which would be combined in the same reservoirs with water supply, would also be needed, making the total requirement about 400 million acre feet of reservoir capacity.

Our estimates indicate that the Corps of Engineers should be prepared to build about 3/4 the total storage requirement, and that the cost would be something like \$15 billion, figured at 1960 dollars.

Now where is the space to store this water effectively and economically to come from? In many respects, this is going to be a harder problem to solve than that of expanding the capability to build the reservoirs, or finding the money to pay for them. I think we will have the construction capacity, all right, but we will have to find many more able planning engineers to carry out programs of the magnitude indicated. I don't want to minimize the money - but if we've got to have the water, the question boils down to the hard fact that we've got to get it, through reservoir construction, and do it at the cheapest cost we can. But as to land on which to store the water, that is something else again. In some **of our river basins**, such as the Ohio, for example, the amount of feasible reservoir space which can be acquired without major disruption of existing development such as communities, highways, industries, railroads and the like, is nowhere near adequate. And it is getting less every day. This is one of the aspects of the water resources job where the country is going to feel the pinch of the lack of enough highly capable and experienced planning engineers who can help us store the most water for the least sacrifice of either land or money.

Even when all these problems are solved--money, planning, capability, space and efficiency--we still will face the

problem of time. If the challenge is to be met, and if construction programs of the scale we are talking about are to be carried out within only 18 years, we must start working on them much faster and quite soon.

To meet Federal flood control responsibilities properly, the multi-purpose reservoir program should be supplemented by about 11,000 miles of levees, floodwalls, channel improvements, and related works costing about \$2 billion. Also, some 3,000 flood-plain studies, costing about \$80 million, should be undertaken to encourage local regulation in effort to minimize the flood risk and reduce the cost of building protection for property that should not be located in the flood plain.

Meanwhile, the augmented reservoir program would make feasible the installation by 1980 of about 33 million kilowatts of new power-generating capacity, costing over \$5 billion.

Any forecasts must recognize the phenomenal increase in the public demand for water-based recreation. In 1961 the attendance at Corps of Engineers reservoirs alone totalled about 120 million. Fifteen years earlier it had only been about 5 million. In view of this growing demand, and in anticipation that new reservoirs will continue to be built and will be better adapted for recreation than older ones, an estimated 300 million attendance by 1980 is conservative.

We believe that the state and local entities should be encouraged to develop the recreational potentialities of Federal reservoirs to the greatest possible extent. However, the Federal Government can and should acquire land for recreational development at reservoir areas and should also provide such basic facilities as access roads, picnic grounds, boat-launching ramps, sanitation and the like. We contemplate that perhaps \$700 million might be spent for such purposes at Corps projects by 1980.

The national inland-waterway system embraces some 20,000 miles of improved channels in commercial use. We have estimated that 10,000 miles of these channels need improvement, and about 1,000 miles of new waterways merit serious consideration for possible future development. The total cost of this possible future work would be about \$8 billion. The urgency with which this additional construction should be carried out depends upon factors which are difficult to predict. In addition to possible

modifications in national transportation policy, the main determining factors are the growth of transportation needs and the future cost of alternative forms of transportation. At present we can only assume that needs will develop at about the same rate in the future as in the past. On this basis we should anticipate investing about \$2.7 billion in the improvement of construction of waterways by 1980.

Also, construction of 14 new deep-draft harbors on the seacoasts and the Great Lakes, and improvement of 46 existing harbors are expected to become justified over the next two decades. The estimated cost of this work is about \$2 billion.

The Atlantic coastal storms early this March have emphasized the need for expanded programs to protect against loss of life and property and destruction of beaches along the national shoreline. Without taking into account changes that may occur in Federal legislation and policy, we feel reasonably sure that we will be called on to undertake more shore protection, including hurricane protection projects, than has been contemplated before this year. A very rough order-of-magnitude estimate might be in the neighborhood of \$1 billion by 1980.

To get the big, overall, comprehensive water resources development job done on time and economically, we shall have to accelerate river basin planning and project surveys. Increased emphasis is being placed on this activity in my own office. And, as a first step in avoiding a bottleneck, special river basin planning units have been established in each of our Divisions. These units will carry on continuing studies of reservoir needs and potentialities for each river basin similar to those prepared for the Senate Select Committee. These studies will help provide the detailed data needed to further refine the estimates of needs set forth by the Committee. They will also help the Corps of Engineers develop more dependable time-tables for providing additional storage capacity, will help locate reservoir sites, and will determine the river flows needed at key points along the main rivers.

We expect our basin-study units to help us cooperate effectively with other river-basin planning agencies such as those recommended by President Kennedy. Pending completion of comprehensive basin plans, they will help us to make sure that our proposed projects will fit well

into future plans and help us give proper consideration to selecting the best of alternative means of meeting resource needs.

Let me repeat that our estimates are necessarily based largely on meeting those requirements for which the Corps of Engineers has primary responsibility. But I might point out that many different water-resource programs tend to converge on those of the Corps, particularly with respect to basic stream flow regulation. our basin-study assignments, from the late 1920's to date; the nationwide scope of our programs, and our involvement not only on rivers but on lakes and seacoasts; the many contacts we have established at community level all over the United States through both our military and our civil missions-- all these bring us into contact with the nation's over-all water-resource needs and problems. And I hope that by telling you candidly how big the job ahead appears to us, it may help organizations such as the National Rivers and Harbors Congress to gear up their own efforts to help get the water resources job done well and on time.

What we are dealing with involves the total future welfare to our nation. Water-resources development must be undertaken not merely because it is profitable, or so that we may live more comfortably. It must be undertaken to preserve our national economy, our security, and our way of life. It is one of the foundation-stones of national defense and of our country's future greatness. No task is more urgent. It is a challenge to us all.

The Dominant Conservation Idea
A Speech before the National Reclamation Association
Portland, Oregon, October 18, 1962

During the 17 months I have been Chief of Engineers, I have seen most of the United States and much of the rest of the globe while inspecting Corps of Engineers operations at home and overseas. On these trips, I have seen much evidence of the series of chain-reaction "explosions" in population growth, technical progress, discontent, and change which are reshaping the world we live in.

From these observations, I have come to appreciate even more the need to push ahead faster with water development to help accelerate the economy right now, as well as to meet the demands of national growth.

While the idea of using water development to help generate economic drive is novel in some parts of the country, it is an old story here in the West. However, it is taking on new dimensions even here. Today, all parts of the country are being caught up in a movement towards full, comprehensive development of water resources undertaken cooperatively by federal, state, and local interests. In fact, this movement is emerging as the distinctive and dominant conservation idea of our time. It reflects considerable change in our national concept of the importance of water conservation, the **size** of the water resources development task, and how best to tackle it.

Take reservoirs, alone. It is expected that about 400 million acre-feet of new storage will be needed less than two decades from now, just to regulate the country's rivers to increase low flows for water supply of all kinds, for water quality control, power, navigation, recreation, and the like. That is an enormous amount of storage; more than all our country has built heretofore; and much of it will be required here in the west.

We estimate the portion of this increased capacity that would normally be built as Corps undertakings would amount to something like \$15 billion, at 1960 dollars. That portion of it to be built in the West would provide more water and power for expanding your irrigated economy, in addition to other benefits. Some of this increased storage already has been placed in construction since the figures were compiled, and

preparations are being made to get more of it underway. It is our policy to plan the systems and structures in such a way as to make maximum contributions to the reclamation program wherever this can be done.

Of course, the reservoirs are just a part of the comprehensive development task, though a key part. When we try to size up the job projected by forecasts of national demands, including water supply, flood control, navigation, power, and other purposes, we find ourselves contemplating Corps programs in the next two decades ranging from \$1-1/2 to \$2-1/2 billion a year for new construction alone.

Both the size and the complexity of the task ahead put a premium on ingenuity and efficiency in both planning and construction.

In planning, we must find a way to place more emphasis on long-range needs, without slighting current requirements. We shall have to build for current needs, as we plan for long-range needs. This is always difficult for if planning is not projected far enough ahead, you run the risk that what is built today may block something needed later on.

By and large, I think the western states have fared well with planning and building water developments. Here future development is largely a matter of making use of relatively unimpaired natural advantages. Conservation in the East is often a matter of finding remedies for problems.

One of the significant trends in water development is the growing participation by the states and their subdivisions in the formulation of comprehensive river-basin plans and in construction. Such participation is essential to good development and should be encouraged.

The federal agencies, too, are taking a broader interest in certain aspects of water development, such as recreation, water supply, and water-quality control. Federal assistance can be of outstanding value in helping the states and local agencies expand their activities in these fields. This kind of cooperation is essential if water resources are to be developed and put to use in a way that will best encourage economic growth.

Another recent change in the water resources scene is one for which this association is entitled to considerable credit. I refer to the new standards for

the economic evaluation of projects established in the place of old Budget Bureau Circular A-47. As I am confident you are familiar with these changes, I don't need to describe them to you. **But I** would like to point out that the new standards must be applied with prudence and foresight. In evaluating hard-to-measure benefits, we Don't want to be hidebound by formulas, but we do want to be sound. And in estimating the productive life of project facilities, we don't want to be myopic, but we do want to be realistic. In the future as in the past, the American people must be able to rely with confidence on the quality of the investment proposals offered them. In a sense, therefore, the more liberal standards mean that we must take greater pains than ever in projecting needs and benefits into the future.

The bigger our plans, the more facts we need to prepare and support them. Thus, we need a much more intensive fact-gathering and fact-analyzing effort, supported by new techniques for handling and using data, to get the most out of comprehensive basin planning.

When we deal with all the water resources of a major river basin, we may often be confronted by a huge complexity of possible alternative patterns of development. Accommodating important, even vital, interests may depend on choosing the right pattern and phasing it in the right time-sequences of work and investment. Modern methods of systems analysis, involving the use of electronic computers, can help us compare alternatives and solve problems on a scale that otherwise would be impossible. So we are thinking of applying such techniques to our water resource assignment. In cooperation with Harvard University, we are carrying out a three-year program aimed at exploring such possibilities. It is possible that they could transform the field of water resource planning.

Still another need is to gather not only masses of facts but a full range of viewpoints concerning resource problems. Actually, interests and viewpoints are facts--facts that help define the social, economic, and political environment in which development will take place. Plans, programs, and projects must be soundly fitted to their human as well as their geographic environments. In dealing with viewpoints, as with any other kinds of facts, the problem is not so much to collect them, as to determine their impact on the end product of resource development. No significant view or interest should be omitted, and none can be permitted to predominate unduly, if we expect our plans to provide a sound foundation for future growth.

In every one of our field divisions, the Corps of Engineers will have planning groups specially charged not only with keeping abreast of changing water needs, but also with keeping in touch with as wide a range of groups and interests as they can. This is an exacting task, made more difficult by the chronic shortage of trained, experienced planners. Nevertheless, we should make every effort to have comprehensive surveys completed or underway in every major river basin in the United States by the end of this decade. Moreover, these basin plans must be kept flexible and up-to-date through continuous fact-gathering programs carried out in cooperation with the widest range of interests possible.

While a great deal more might be said about planning, I want to leave time for a few words about construction. Our national capability to build efficiently and economically will be one of the yardsticks that will measure not only how well we can live, but also how safely we can live on this crowded and disputed earth. The cheaper and more efficiently we can build, the greater the use we can make of our water resources. I am confident of our national ability to increase construction efficiency. At the same time, effort should be placed on generating new ideas, and on developing new methods, new materials, new standards of efficient management and techniques for achieving increased construction efficiency, plus an approach that reasonably recognizes few barriers as insurmountable.

For example, the Corps of Engineers is now considering the possibility of linking waterway navigation systems in separate river basins together by cutting open channels through the land masses that divide watersheds. This involves a massive carving up of the earth's surface on a scale that has not been previously attempted.

To facilitate such undertakings, we are now working with the Atomic Energy Commission to explore the possibility of using the might force of nuclear energy in an effort to cut the costs of excavation. Needless to say, our approach to this idea must be made with great care, and each step surrounded with multiple safeguards. At this early date, we cannot even speculate on the outcome of such research, or how its fruits might subsequently be applied to the various aspects of water development, but if the potentiality is there, and there is a way to harness it, no pains should be spared to find out.

To the extent that more efficient and economical means can be found to move large quantities of earth, or to build a dam, **line** a canal, stabilize a riverbank, or do any of a score of other important construction jobs, a much better, bigger country can be built. Research to such ends should be encouraged and supported as a highly important element of water development.

As we progress with water development, it is of course necessary to integrate new construction into **going programs** in an orderly way. The Rivers and Harbors Act of 1962, recently passed by the Congress, will be most helpful. Among the other developments, it authorizes for construction, it provides 31 new multiple-purpose reservoirs for the Western states, aggregating over 11 million acre-feet in storage capacity. Among these are dams such as North Fork on the San Gabriel in Texas, Camelsback in Arizona, New Melones in California, Lost Creek here in Oregon, Wynoochee in Washington, Bruces Eddy in Idaho, Clinton in Kansas, and Kaw in Oklahoma, to name a few.

Further, the new Appropriations Act provides for stepping up the Civil Works program by some 7 percent, including funds aggregating \$365 million for the 17 Western Reclamation States. It provides funds for 21 new construction starts and 23 new planning starts on various kinds of projects in these states, including construction money for seven of the new multi-purpose reservoirs embracing storage for various needs.

Also, we look forward to further opportunities to expand development of small water resources projects of various kinds under the new Public Works Acceleration Act. These include flood control projects costing not over \$1 million in federal funds, and small navigation projects not to exceed \$200,000, which I am empowered by law to authorize for construction. Further, we have a number of small projects already authorized by the Congress which may be taken up on short order. Also, recreation facilities may be provided under this act, and we may accelerate, improve, or rehabilitate existing projects.

I would like to add one more thought in closing. We of the Corps of Engineers look to you of Reclamation to help us realize the full measure of benefit from our western programs. On the Missouri, the Columbia, in Texas, in California, and in many other regions and river basins, we have undertakings which are already serving considerably, but which can serve even more to

help increase the productivity and prosperity of the West through joint action. I hope that in the future we can find more and more occasions to work together in this way--more opportunities in which together we may achieve greater benefits from our endeavors.

I thank you.

The Role of Construction in the Space Age

A Speech at the Conference on United States Government
Construction Contracts
Washington, D.C., November 6, 1962

Professor Nash, Mr. Keiser, distinguished guests and participants in this conference on Government Construction Contracts. George Washington University% National Law Center and Federal Publications, Inc., are to be commended for sponsoring this symposium devoted to a study of mutual problems affecting construction contractors and Federal contracting agencies.

As all of us know, the Federal Government is the country's largest purchaser of construction services--buying many billion dollars worth annually. If for no other reason, the extremely large cost to the taxpayers, alone demands that all of us in the Federal construction agencies make certain that the American people receive the highest quality work for the lowest possible price, and on time.

Construction, one of the most complex and vital areas of Federal activity, will become even more complex in the age of space. Our jobs will include some of the most demanding ever tackled. In the aggregate, they will be the costliest since the World War II construction task. They will include some of the most difficult, technically, since the Manhattan District produced the original "A-bomb". New techniques, new materials, new conditions of many kinds will be involved and the job will have to be done under the pressure of American growth requirements, national defense, and "The Race For Space2

All three elements directly concerned - the Government, the construction industry and American labor, face the necessity of thoroughly reviewing and revitalizing our ground rules. All of us must look far ahead to anticipate problems and come up with effective answers when they are needed - not after setbacks are experienced: preventive foresight - not corrective hindsight:

Let us enumerate some of the major areas of expanded Government construction.

First, is the newest program to support Space Exploration. While the program can be visualized now only

in barest outline, it looks like at least a half-billion-dollars-per-year construction job.

Next is the Civil Defense Shelter Program - this nation may be facing a program which could eventually involve many billions of dollars of construction, partly financed by the Federal Government, but largely financed by the private sector of our economy. In executing the current National Fallout Shelter Survey Program under direction of DOD, which, of course must precede any large scale construction of new shelter, I think it significant to mention that the Corps of Engineers has teamed up with the Bureau of Yards and Docks so that this effort from the beginning will be a joint Army-Navy effort.

Then, we must catch up with the backlog of water resources, highways and other communication needs - in themselves "headline jobs" of unprecedented scope and size.

Defense construction will in all probability continue to be extremely large - with prospects for new elements such as antimissile missile construction to be considered.

After that comes the country's more ordinary construction jobs, which I need not enumerate here.

Thus both survival and progress will be measured by what we build. The volume and type of Government construction reflect areas of national importance which demand the earnest attention of architects, engineers and contractors and more than a score of Federal agencies.

Let's take a look now at some of the construction implications of space. Early in 1946, our principal achievement in probing space was reported in page-one headlines which told how the Army Signal Corps had bounced a radar impulse to the moon and back. The United States has come a long way in the past 15 years. To the point, in fact, where President Kennedy has now called for an all-out national effort to land men on the moon and return them safely before 1970. We now stand on the threshold of manned-space explorations the way Spain did over 450 years ago when men began to claim that the earth was round and Columbus set out to prove it. But that's where any similarity stops.

Before our Space-Age Columbuses can take off many theories will have to be put to the test here on earth. Along with the scientific advancement of space flight

engineering, the full capabilities of the construction industry must also be brought into play to provide the research, development, test and operational facilities for space vehicles, their boosters and guidance systems. Thus, the first leg of the journey to the moon will be right here on the ground, and we of the construction game have to accelerate our efforts before science can set out to overcome the pull of gravity.

I would like to point out here that while the space age has brought with it demands for more specialized construction, Federal agencies have not lessened their efforts in seeking improved methods for carrying out more conventional building programs. Our sister agencies, many represented here at this two-day conference, are working closely with engineers and contractors in attempting to apply new solutions to old problems which touch every phase of construction engineering--from small, single-family homes, to the giant multi-purpose water resources development projects. While I may call upon my own personal experiences and those of the Army Engineers, I am certain the thoughts and comments I express here today are equally applicable to the engineering and construction efforts of the GSA, Bureau of Yards and Docks, NASA, Air Force Civil Engineers, Bureau of Reclamation, Bureau of Public Roads, AEC and VA.

The National Aeronautics and Space Administration (NASA) has recently asked the Corps of Engineers to expand its support of the space program by performing major engineering and construction for new space projects, including the manned space flight projects.

Working under this arrangement, and with design criteria furnished by NASA, the Corps of Engineers will supervise the architect-engineer contracts for design and the prime contracts for the building of these projects. We have already worked in this field by providing engineering and construction support to NASA and its predecessor organization on several jobs.

While many details on this program are still lacking, we do know that the first Saturn rocket was successfully launched at Cape Canaveral, Florida week before last and that preparations are well underway for additional Saturn and other large boosters to be launched from that facility. In order to prepare for these shots, 73,000 additional acres will be developed at the cape, including many new launch complexes. We are currently engaged in acquiring the real estate for these projects which will

increase the present size of Cape Canaveral more than five-fold. Cost of additional land alone will total approximately \$60 million.

Plans call for these launch sites to be widely dispersed and far from habitation for safety reasons and because the boosters will be the largest ever developed and the noise generated by them will be earsplitting. Simultaneous with the construction of these new launch facilities a completely new Manned Spacecraft Center will be built at Houston, Texas, for the design and testing of space vehicles and their crews. In conjunction with these activities, powerful liquid and solid fuel rockets for the Saturn and Nova projects will be tested at other facilities yet to be constructed in Southern Mississippi and Louisiana. These new centralized test facilities and support items are currently estimated to cost some \$300 million and will include the intricate control centers, and the static and dynamic test stands necessary for the captive firing of boosters and second-stage rockets.

In accordance with the announcement by NASA last month, the U.S. Army Engineer District in Mobile is taking action to acquire or obtain easements on 141,000 acres in Southern Mississippi and Louisiana with access to the Pearl River.

It is important to the space construction program that these facilities be built on sites located on or close to our navigable inland and intracoastal waterways. NASA wants to place new facilities on the waterway because many of the future boosters will be too heavy to ship by air and too large for existing railway and highway bridges. Earlier this year, the first Saturn booster was transported from Huntsville, Alabama, to Cape Canaveral via barge. Thus we see that the space age where speed is measured in 10's of thousands of miles per hour is firmly attached to speeds of 4 mph on our waterways.

Our engineering and construction industry is ready for the space job. Working together, the Corps and industry have had considerable experience designing and building research and test facilities at the White Sands Proving Ground in New Mexico; fabrication and test facilities for both the Army Ordnance Missile command and the Marshal Space Flight Center at Huntsville, Alabama; as well as launch pads and service towers at both Gape Canaveral and Vandenberg Air Force Base in California. And just as they did in building for production of the first "A-bomb"

under the Manhattan District, construction contractors have proved themselves highly competent to take on revolutionary new tasks and execute them fast and effectively. Within a relatively short learning time the industry has seeped into the billion-dollar ICBM base programs and has acquitted itself well in the handling of a pioneer job of an exotic nature. In these new assignments the industry has taken the lead in developing techniques and methods for working with new concepts and material.

The compressed time frame of the new space program, as well as the new and highly technical requirements, demand the highest sense of responsibility on the part of all interests concerned. The Corps will necessarily have to be discriminating and extremely strict in qualifying bidders, in the inspection and acceptance of work, and in other matters of contract administration. Contractors and labor will have to establish their own volition, new standards of responsibility for quality and speed of work. All of us must look ahead - to devise the techniques, equipment, skills and materials that will be required.

In support of improved construction techniques and materials for highly specialized work such as this, the Corps of Engineers is carrying on basic research within its own laboratories and by contracts with top research and engineering organizations. We are constantly probing as far as we possibly can into materials, the design of facilities and structures, equipment and construction problems.

The current work in building ICBM bases for the Air Force will contribute much to the industry's capability to carry out space age construction efficiently and economically. The ICBM Construction Office at Los Angeles, under operational control of the Air Force Ballistic Systems Command, CEBMCO, was given one job to do -- build the missile bases and do it well, economically and fast.

The Office of the Chief of Engineers, down through the Divisions and District offices, as well as all other appropriate units, are continuing to give required support to CEBMCO and the ICBM construction effort.

The same support is now being marshalled with the Corps to give the stepped-up space construction program of NASA its needed boost.

Most of the space test facilities will be built for vehicles still under development and therefore design change orders can be expected, as in the ICBM program. Architect-engineers and contractors will have to shoulder heavy responsibilities for the speed with which the total space program moves forward, because much of the initial efforts will depend on the construction of basic research and test facilities.

The industry has a tremendous opportunity and should start preparing its internal organization to expedite the work put in place. General contractors must, early in each job, set up machinery with their sub-contractors to work out anticipated problems. I urge all prime contractors to agree on procedures with their contracting officers ahead of time so that when they come to them with substantial changes in a facility's design, resulting from modifications in the space hardware itself, construction can go forward without a break.

One of the advantages of such an approach will be to provide both the Government Contracting Officer and the contractor with an opportunity to work out their differences in the field - at the place where the problem arises and at a time when the facts are readily obtainable and positions have not yet become solidified. Talking problems out at this level should most certainly reduce the number of claims that will have to be fought through a time-consuming process of the Appeals Board and the courts, and work to the mutual advantage of everyone.

Another important area where improvements can be made is in the field of labor relations. Jurisdictional disputes make up one of the more sensitive areas of labor relations and much can be done to improve past records. Space construction will present many union jurisdictional questions involving installation of new and highly complex equipment, new construction concepts, and other matters. Let's look ahead on these potential trouble spots and cure as many of them in advance as we can so interruptions of work can be avoided. With both labor and industry eager for us to win the space race, it's primarily a question of foresight and good management on both sides to keep out of misunderstandings and trouble.

In the past on certain types of NASA construction, our District Engineers have found it necessary to prequalify contractors and subcontractors bidding on the work. This practice will doubtless be continued as necessary - with the approval of my office and NASA. Prequalification

will not be used in every case, however, but rather when the particular nature of the work seems to call for it.

The criteria for prequalification of contractors include: experience, past work performance, equipment and facilities, integrity, contract administrative ability, and availability with respect to existing workloads.

From the overall point of view, prequalification will assure that the NASA construction program will be carried out by the lowest qualified bidders, to the benefit of all concerned--the construction industry, the using agency and the public.

The construction industry has a unique role in space construction and its capabilities must keep pace with the ever changing requirements of the design engineers. At times even before the general contractor completes the basic construction, it is necessary for the hardware manufacturer to begin installing highly technical instrumentation equipment. At this point in the past, disputes have sometimes arisen and the work stopped. We must see to it that there are no such shutdowns and that the work schedule proceeds in an orderly manner, and without a break. The construction contractor **must** prepare for and effectively handle the transition from construction to operation equipment installation by others.

The general contractor can be expected to play an increasingly important role in Space Age construction. In fact, heavy construction calls for a type of on-the-job ingenuity in meeting whatever conditions the **Vagaries** of nature or man may present which are not usually encountered in the more closely controlled environment and work conditions of the laboratory or production line.

The day-to-day competition between construction contractors breeds a type of resourcefulness that is of great value in getting a job such as Space Age construction done.

We know that when the time comes to bid, individual contractors will come forth and pit their firms and reputations against all comers. When the work is especially large or complex, joint ventures will be formed giving the Federal Government a combination of specialists, who are masters of their own particular

trade, in excavations, foundations, concreting, steel, erection or other specialized work. These individual firms, when teamed together, will assure us the highest degree of capability.

Since the construction tasks for support of space exploration present the most difficult assortment of problems, I have dwelled at length upon them. I do not want to minimize, however, the continuing problems that all Federal construction agencies **must meet** in defense construction, in water resources development, or in other fields I mentioned earlier.

I am sure that the heads of all the other Federal construction agencies represented here today will agree with me that we and the construction industry must find a way to get the most for the dollar. The demand on the limited number of taxpayers dollars for the many vital programs will be great. The public, their representatives in the Congress and in the Executive Branch will look longer and keener at each dollar - to get full worth from it. The scope and objectives of these programs must be kept realistic, and I think they will be. The construction industry and agencies such as the Corps of Engineers which employ them will be in the constant spotlight of public scrutiny.

The forbidding conditions and the unknowns we face are only challenges to be met, just as we do when soil conditions encountered in digging an ICBM silo differ from what the test borings showed, or when the geologists fail to find a thin fault in the foundations of a dam, or we have to build defense bases on snow, ice or permafrost in the remote Arctic. There have been periods when the obstacles seemed overwhelming, but as long as the engineer and the builder and their workmen take the initiative to find the ways to do their jobs, whatever they are, and acquaint themselves with the problems of their fellow men, they will continue to keep their independent place among the leaders who contribute to the security and development of our way of life.

This, then is the challenge that confronts us, whether constructing ICBM bases, space flight test facilities, or carrying out basic research that will let man safely explore the moon and the planets beyond. I am confident that the construction industry will do its job well.

Remarks at the Engineer Instructors Conference
Fort Belvoir, Virginia, July 24, 1964

I have been looking forward to this chance to speak to you. It has been two years since I addressed the Engineer Instructors -- and a lot has happened since then.

When I last spoke to you, we in OCE were still in the throes of reorganization. At that time, we forecast that the impact would scarcely be felt in the field. Most of the changes would be in my office.

And so it was.

We lost the direct operational responsibility for training, doctrine, Research and Development, personnel management and Engineer Supply. We retained the functions of Topographic Mapping, Military Construction, Civil Works and Real Estate.

OCE's relationships with the Department of Defense remain about as they were. As the Engineer advisor to the Chief of Staff of the Army, I have an official hunting license which allows me access to those activities which we now monitor instead of controlling directly. We consult, advise and do anything else necessary to improve the Corps' combat readiness.

The Corps remains a full-fledged combat arm. OCE's major military efforts now emphasize formulation of policy, planning and conducting an aggressive monitorship of all matters related to military engineering. To carry out this monitorship we have our Directorate of Topography and Military Engineering which keeps in close touch with the DA staff, unified and specified commands, Army Commands, schools, field armies, MAAGs and Missions -- wherever there are Engineer activities.

General Hayes, who runs T&ME, has the Directorate organized into three major divisions: Mapping and Geodesy, Topographic Sciences and Military Engineering.

The first two divisions look after our extensive mapping and geodesy missions including the activities of AMS, GIMRADA, the 64th and 30th Topo Battalions, the SECOR satellite program and other systems which enhance these fields. As you know, we have mapping activities going on in over 50 countries.

The Military Engineering Division keeps abreast of such things as the engineer phases of Civic Action and construction support to the Air Force; it recommends changes in troop organization, training and engineer doctrine; and it maintains close liaison with STRICOM, CONARC, 11th Air Assault Division and other agencies or activities where our monitorship will aid our defense posture.

Another interesting activity in T&ME is the Engineer Strategic Studies Group -- a very active outfit which plays a vital role in the creation of many high level Army staff studies. Some of its work has to do with the planning for a type Corps Force for use in Asia; PAMUSA, the role of the Army in post attack Mobilization; CDC's "Oregon Trail" study of Tactical Nuclear warfare; and other studies of equal strategic importance. This Group has entry into all the high level places. It shapes a great deal of the strategic thinking in all fields of endeavor of the Department of the Army. And, of equal importance to you and me, is that the work of this Group insures that in these high level studies Engineer planning is not being overlooked.

All of the people of T&ME -- indeed, all of us in OCE -- are ready to go anywhere or do anything to improve the combat effectiveness of the Corps. Along this line -- I look to you gentlemen to keep our brother services informed of our great interest in our combat functions, and our developments in them. I hope you will keep well informed yourself. T&ME operates quite informally; feel free to visit, phone or write for any assistance that may be useful to you.

In the nearly three years I have been Chief, I have travelled over 300,000 miles and visited scores of Engineer organizations, projects and exercises. You might be interested in some of my observations.

Aside from being a combat arm, we are the largest construction agency, real estate operator, and mapping organization in the world. We are also the Nation's largest developer in the field of water resources.

Our Civil Works program in the fiscal year just ended reached about \$1.2 billion. We expect it to increase for a while at the rate of about five to six percent per year.

Our annual real estate expenditures are about \$160 million for the acquisition, disposal and management of

approximately 36,000,000 acres of land around the world for the Army, Air Force, AEC, NASA and many other clients. To illustrate a typical real estate operation -- Exercise DESERT STRIKE, last spring, required our negotiation of some 4,500 separate permits for lands in three states involving about 12,500,000 acres.

Our design and construction support for NASA's Manned Lunar Landing program is another of our large and challenging activities. During the last fiscal year, we placed more than \$300 million worth of construction for NASA in locations such as the spaceport at Cape Kennedy, the Manned Spacecraft Center at Houston, the Mississippi Test Facility and other NASA installations throughout the country.

We continue to study problems associated with construction of a base on the moon. We have just published a 1:5 million scale map of the visible side of the moon and hope, ultimately, to enlarge this scale to 1:25,000 for more detailed use by our lunar explorers.

Our Civic Action program is a booming one. Almost every nation in South America and dozens of others throughout the Free World enjoy some sort of Civic Action program and we help the DA staff and field agencies to shape them up.

Paralleling Civic Action somewhat is the overseas construction our Districts and Divisions accomplish upon various requests by the Agency of International Development. We've built airports for Iran and Pakistan, an air terminal for Saudi Arabia, a highway for Afghanistan and are working on other major construction for these and other countries.

A.I.D. frequently calls upon us also for studies, surveys, designs and consulting services. In this activity, we have dozens of engineers in the field working with countries such as Egypt, the Congo, India, Jordan, Australia, Greece and scores of others.

Many benefits accrue to these nations under both the A.I.D. and Civic Action Programs. They become more self-sufficient economically and militarily, as we leave behind us improved public works, trained manpower and a developing awareness of technology.

Benefits also accrue to us through the promotion of international friendship, increased foreign trade and the enhancement of our national prestige.

of equal value is our accumulation of a wealth of foreign area information and the creation, in effect, of a large group of foreign area specialists within the Corps of Engineers.

My wanderings have also brought me in contact with our problems in providing engineer troop support for the Air Force. Our support requirements for Tactical Air Commands under CINC MEAFSA are going to be heavy. I am pleased to report that we and the Air Force are getting along well together in our mutual effort to improve our capabilities in this potentially vital role.

I was down at Benning a few weeks ago to visit the 11th Air Assault Division. Things are going well there and I'm looking forward to seeing our 127th Engineer Battalion in action during the Division's field tests coming up in September. We've been working closely with the 11th Division. Jointly, we have developed some fascinating concepts of air assault construction support. It will be interesting to see our theories in practice.

We have made a lot of progress in the ADM business. Three ADMs have been eliminated from the system, including the two most cumbersome ones. We are looking forward hopefully to the development of the AND - the Advanced Nuclear Demolition.

With these better munitions, with the ADM platoons just authorized for stateside combat battalions, and with a much needed speed-up of the weapon delivery cycle, we will have a truly advanced nuclear capability.

I spent some time recently observing the joint Exercise DESERT STRIKE. Those 12,500,000 acres I just told you about allowed two Corps to maneuver against each other over a front as wide as 150 miles. That's a lot of front, particularly for a two division Corps making an assault river crossing. Obviously, our engineers worked like the devil. There weren't enough of them, but they worked hard. Many of the uninitiated were happy about the situation, but those of us who are old hands know better. These troops obviously lacked opportunity to receive proper training.

Here are some of my thoughts on **DESERT STRIKE**:

1. Planning for engineer troop support was inadequate .. perhaps from a lack of appreciation by the general staff planners, incurred by inadequate Engineer representation during the planning phase. The old rule of thumb of "one Army combat battalion to back up each Division" and similar planning cliches just won't do any more. A campaign or a battle is now so complex with its alternatives in size, speed, weaponry and mobility that each Engineer Plan should be flexible, custom-tailored job accomplished by a real "pro". I am afraid the Army's preoccupation with "functionalization" has caused a trend toward Staff Engineers disappearing or losing identity by being absorbed by G-4s, etc. I feel that there is now, more than ever, a need for an identifiable, full-time Engineer section on every staff from the division to DA, and I shall continue to say so and to fight for such an Engineer Section on. every occasion that presents itself.

2 It was apparent that the stateside Divisions need more training in river crossings. so do our battalions and bridge companies. It takes a lot of practice to maintain the skill and teamwork required for supporting a river crossing. While on the subject of training, or lack thereof, I'd like to mention an imposition upon our training time which must be carefully controlled. My visits to Engineer units reaffirmed that the morale and skill of fine outfits can easily go down the drain through misuse by the Post commander of other non-Engineer authority. While many post projects do provide splendid individual and unit training, many others do not. I have seen good battalions used as a labor pool, as stevedores, as police and maintenance details and in other "dog-robbing" roles whose value-of-the-moment could never compensate for the great harm done to these previously splendid organizations.

3 **DESERT STRIKE** pointed up either a disinterest in or the lack of awareness of, the value of obstacles and barriers. Barriers were shallow; obstacles were seldom covered by fire; few troops other than engineers seemed to use or know anything about mines in either offense or defense.

4 Camouflage and concealment was very poor. while our camouflage materials are pretty poor, we can still make better use of them than we did. And there is a lot that can be done with regard to better site

selection, better dispersion and old-fashioned camouflage discipline.

I am continuously impressed with the thought that in spite of our rather exotic equipment the things which cause us Engineers the most trouble today are the same ones that have plagued us for as long as there have been engineer troops. I can easily visualize Richard Gridley or Rufus Putnam composing the following cliches for delivery to his commanders and Engineer Instructors:

1. Those are Engineer soldiers -- don't dull their sharpness by work that any soldier can do.

2. Get the other combat arms to assist you in denial operations.

3. Make sure the commanders from Brigade, up, know exactly what your capabilities are.

4. Try to influence the awareness of all to the use of camouflage, concealment and dispersion.

5. There is a need for better terrain information and engineer intelligence; this is a function in which all arms participate.

6. River crossings are slow, requiring careful planning, much equipment and prodigious Engineer effort.

7. Exercise intellectual curiosity -- keep abreast of *things and inform others of your knowledge. Encourage a cross-fertilization of ideas amongst all whom you influence.

8. Keep in touch with the home office.

9. The Trained Live ... The untrained Die.

Can you think of many new ones?

I have followed with great interest your agenda of the past four days. I hope it has been equally interesting to you and that it has provided you with much sermon material to enhance your missionary work for the Corps.

To your captive congregations, I hope your preaching will at least cover the following matters right out of the bibles of military engineering:

1 That the ability to walk on water has been a lost art for over 1900 years. Water barriers must still be crossed the hard way. While river crossing means and techniques are steadily improving, any combat crossing is a major task and is one which, unfortunately, is frequently underestimated by commanders. Make sure that you continually preach that river crossing operation planners must call upon Engineers for advice and that this advice must be called for right from the initiation of ideas for the crossing. Such plans must be based upon engineer capabilities, and must provide for adequate support plus a reserve for contingencies. Come to think of it, this applies to almost any type of operation -- not just river crossing.

2 Do not neglect camouflage. It is as important today as it ever was. So are barriers.

3 Commanders must not become complacent or overly patronizing over the Army's new mobility gadgetry. The Army has developed quite a few new and sophisticated means for driving to work, but real mobility for the Army as a whole, truly still begins and ends with the Engineer. Our new craft and vehicles indeed allow us to cover more geography sooner -- but this simply means that the commander will meet many more obstacles for his Engineers to bridge, to clear, or to bypass. A good deal of these improved mobility means create in themselves, vastly increased requirements for Engineer effort. And -- the same increased mobility on the part of the enemy makes a barrier and denial operations more difficult and a matter of true concern to every commander and soldier, on, or behind, the battlefield.

4 There are many blessings which flow to the combined Arms Commander who knows his Engineers' capabilities -- who uses them wisely, and who constantly thinks about and provides for the necessary Engineer means.

5 And there is woe that befalls the Commander who does not...

Remarks Before the Senate Committee on Public Works,
Subcommittee on Flood Control and Rivers and Harbors
Washington, D.C., March 22, 1965

Mr. Chairman and Members of the Committee:

As you know, I am approaching the end of my term as the Chief of Engineers of the United States Army, and also the end of a 36 year career in the Corps of Engineers. Under the circumstances you will, I trust, forgive a brief backward look on my part; not because I am particularly nostalgic about my own career, but because it happened to have spanned a period of revolutionary change in the Nation's approach to the development and utilization of its natural resources. During that period all of us have, I believe, learned many lessons and gained much perspective. It has seemed to me that those of us who have been closest to the Federal Government's efforts in this field should share our perspective with those who will be confronted with the increasingly important, and increasingly difficult, problem of meeting the Nation's rapidly growing need for the development of its water and related resources. For it has truly been said that "past is prologue/

When I began my Army career as a Second Lieutenant, fresh out of West Point in 1929, the Corps of Engineers had two main responsibilities in the civil works field: the design and construction of navigation works, and the carrying out of a great project -- which had been authorized only the year before -- to harness the Nation's greatest river, the Mississippi. The Federal Government had not yet accepted a Nation-wide responsibility for flood control. That was not to come until 1936 when the Congress enacted the first general flood control legislation. Today, the Civil Works Program of the Corps encompasses not only navigation and flood control, but also the generation of hydro-power, the provision of water for municipal, industrial and agricultural use, the storage and release of water for the improvement of water quality, the drainage of wet lands, the enhancement of the fish and wildlife resource, the development of the vast recreational potentials of the projects by which these ends are achieved, and the preparation of comprehensive river basin plans. And since I began my career the annual appropriations for the Civil Works Program have increased from less than 100 million to well over a billion dollars. This striking change has, in reality, all taken place in less than 25 years; for during the Second World War and the Korean

conflict all of us had, as you know, urgent business elsewhere.

Behind these tremendous changes were the growing needs of the expanding economy of the greatest industrial Nation in history. These needs will continue to grow, and the Nation's programs for meeting them must continue to grow. But one of the lessons we are just beginning to learn is this: A modern nation cannot be content with merely meeting needs as they develop it must use its public works programs as a means of accelerating the growth of the economy, and of enhancing the welfare of its people. **This is** one of the fundamental ideas that should, in my opinion, guide this Committee in its future deliberations.

As the Civil Works Program has broadened in scope and increased in magnitude there has been a fundamental change in the nature of the problems we have been called upon to solve. Let me illustrate what I mean.

When I first began to grapple with the problems of resource development, our main concern was with the investigation, design and construction of individual projects; and quite often these projects served but a single purpose. Looking back now I can see that we didn't appreciate what an easy job we had then. Today we must plan for the comprehensive development of major river basins, and our goal for each basin must be a plan that will, in the long-run, make the most of all of its resources. This requires us to consider all of the alternative uses to which these resources could be put, and all of the alternative ways in which they could be developed. The single-purpose reservoir has become virtually a thing of the past. The multiple-purpose project now dominates water resource development. Planning has been revolutionized and has become immeasurably more difficult. No longer is it a matter of finding a site, designing a structure, and then building it. Our first concern must be to discover that combination of projects and programs which will make the greatest long-run contribution to the wealth of the Nation and the welfare- of its people; keeping always in mind that whatever we invest in such projects becomes unavailable for meeting other urgent human needs. In modern planning, therefore, we must utilize the know-how of experts in many fields. Economists, agricultural experts, specialists in recreation, biologists, and professional people in still other fields have important roles to play. Moreover, river basin planning has become a cooperative undertaking in which the various agencies

able to make important contributions must work together in close harmony in formulating a truly comprehensive and unified plan. And once such a plan becomes available it must be used as a guide by all of the agencies concerned.

Comprehensive and coordinated development of major river basins has been urged since the time of the "Conservation Crusade" led by President Theodore Roosevelt. Many commissions and other similar bodies have, during the ensuing years, supported the concept. The most recent, and probably the most effective, of these was the Senate Select Committee on National Water Resources. The report of this Committee constitutes a landmark in the Nation's efforts to achieve more efficient use of its natural resources.

The Select Committee's recommendations were embodied in the Presidential Standards issued by President Kennedy in 1962, and these Standards were printed as Senate Document No. 97. A happy conjunction of the report of the Select Committee, the Presidential Standards, and the provision of an adequate legislative base by Acts of Congress over a period of many years, has finally made it possible for the Federal Agencies, working with the States, to provide the kind of comprehensive river basin plans called for by President Roosevelt at the beginning of the present century. I count myself fortunate to have lived through this period of fruition, and to have been able to make some contribution to a development which will mean so much to future generations.

I am convinced that what has been accomplished is a good thing for our Nation, and I earnestly urge this Committee to remain steadfast in its support of comprehensive and coordinated planning for the development of our Nation's great rivers. You are on the right track.

This is an appropriate point to make a comment that has been "welling up" in me for some time. Now that I am about to shift my burden to a new Chief of Engineers, I feel an obligation to mention a problem that will probably distress him as much as it has me. It has become somewhat fashionable lately to intimate that the Corps of Engineers is incapable of doing modern comprehensive planning. that we are interested solely in building engineering "monuments." It is my hope that my brief recitation of the revolutionary changes that have taken place in Corps planning during my own career will convince you that the Corps is capable of adapting its planning to the needs of a modern industrial economy. In fact, . believe that the Corps of Engineers has done more

than any other single agency actually to put into effect the kind of comprehensive planning which far-seeing men have advocated for many years, and which the Senate Select Committee so recently commended. Our basin planning program began as long ago as 1927 when the Congress authorized us to develop the so-called "308 reports." These were the first comprehensive plans to be submitted to Congress by any agency, and they constitute the basis for some of the great river basin programs now being carried out. Progressively over the ensuing years we have improved our planning. An example of a modern comprehensive plan is that developed for the Delaware River Basin under Corps leadership. This plan has come to be considered a milestone in the progress of river basin planning. It was authorized by the Congress, and is now being carried out by several agencies of the Federal Government, the States, and the **Delaware River Basin Commission** established by an interstate compact. We are presently participating in the development of comprehensive plans for a number of major river basins throughout the Nation.

Our accomplishments can speak for themselves. I should like to summarize them for the record. Through the Civil Works Program the Nation has been provided with about 500 commercial harbors and an inland waterway system comprising about 22,000 miles of waterway. More than 300 reservoirs have been built or are under construction. For flood control thousands of miles of levees, floodwalls and channel improvements have been constructed. The hydropower installations of the Corps have an aggregate capacity of 8.8 million kilowatts. At our multiple-purpose reservoirs we have provided 2.3 million acre-feet of capacity for the storage of municipal and industrial water. At those projects where records of recreational use are maintained -- and this does not include all of our projects -- we logged the amazing total of 156 million visitor-days in 1964. We are increasingly providing reservoir capacity for the storage of water to be used for quality control. We have built projects to protect hundreds of miles of shore. In many instances our channel improvement projects have enabled rich lands to be reclaimed by drainage. Other projects of a more specialized nature have also been carried out under the Civil Works Program. I am proud of this record and I believe that this Committee has a right to be just as proud as I am.

Despite all that has been accomplished in bringing the Nation's rivers under control and in developing their waters for use, we are, I believe, still in the initial

stages of river basin development. The experiences of the past twenty years convince me that one of the great problems confronting the Nation is the regulation of its rivers for all purposes: not just to reduce flood or to improve navigation, but also to assure adequate dry season flows for future industrial and urban development, to maintain a quality of water compatible with such developments, and at the same time compatible with recreational use and the continued existence of our fish and wildlife resources. This will require the planning and construction of great systems of regulating reservoirs in our major river basins. This is a job that the Corps of Engineers can, in my opinion, do better than any other agency. And this is the great task of the next several decades.

I would be derelict if I did not express to you my concern on the subject of basin monetary authorizations. Two years ago for the first time in history a Chief of Engineers found himself in the unfortunate position of stopping some contractors in mid-stride, where although project appropriations were in hand, basin authorizations would be exceeded if expenditures of available funds were not stopped. This resulted in inefficient use of our means and resulted in placing both the Administration and the Congress under the gun. Since that time, I have assured that contracts are not initiated unless there are both funds and authorizations available sufficiently far ahead for Congress to give deliberate consideration to these requirements. General Graham will present the situation on those basin authorizations which are again approaching the limit on our capabilities. I urge sympathetic consideration and early provision of additional authorization to carry us forward atleast three years.

I also bespeak your continued support of a program which the Corps was authorized to undertake after its objective had received the strong support of the Senate Select Committee. I refer to the program under which we provide a flood plain information service. This is an important Federal contribution toward better use of the Nation's flood plain lands. It provides the States and their subdivisions the expert assistance they require in regulating the use of their flood plains. I look for this program to yield important results in the years to come.

I should like to close this statement by thanking you, on behalf of the Corps, for the kind and generous consideration that we have always received from the Congress.

Remarks at the Engineer Dinner
Fort Belvoir, Virginia, April 23, 1965

Some of you who are old enough may recall how in the final act of the play, "You can't Take It With you," the grandfather arose to address the annual family dinner. His lines began, "Well, here we are again."

Well, here we are again, at a family gathering for the Engineer Officers available in the area. For you, it is another Engineer Dinner, another chance to renew friendships and to make new ones. For this grandfather, it is all this -- and more too. It is one of the last speeches in the last act. It is one of the highlights of a long journey -- 36 years of traveling down what has been the main highway of life. Now, I'm giving the turn signal to move off on a side road where the traffic will be lighter, the way smoother and the grades easier. However, I know it will be neither as exciting nor as satisfying as the road I've been traveling.

Several years ago, when I began thinking about the inevitability of this evening, I had some qualms about the kind of organization I would be turning over to my successor. I was concerned with the effects of the Army headquarters reorganization on the Corps; concerned with the Corps losing its place and identity in the Army, and I was concerned that the assignment, handling and development of our personnel would suffer.

Tonight those qualms no longer exist. I am proud of the organization I am turning over to General Cassidy. The Corps' image has never been brighter; it commands the respect of the American public, our sister services, and the other agencies of Government. The proof of the pudding is in the fact that General Cassidy was nominated and confirmed to three stars at the outset of his term, and there will be no waiting -period after he assumes the office of Chief.

Since becoming the Chief of Engineers four years ago, I have travelled almost 400,000 miles -- over half of that during the past two years. I have seen the Corps and its people across the world in every type of mission and in a wide variety of jobs. At every major installation under my command I have been proud of our leadership. Even more important, at every major military organization I have visited, the commander has been outspoken in his praise and confidence in his engineers. Additionally,

Engineer officers, are holding many key and unusual positions in the Army and Department of Defense. Let me -enumerate a few who are filling or recently filled some of these posts:

Lt General Starbird is the director of the Defense Communications Agency; Lt. General Ely is the Deputy Director of Defense Research and Engineering; Lt. General Lincoln is the DCSLOG of the Department of the Army; Major General Lampert is the Superintendent of the U. S. Army, Europe; Major General Oberback is the Director of Operations of the U. S. European Command; Brigadier General Dunn, Deputy Chief of Staff, 8th Army; Colonel Larry Vogel was Chief of Staff of the Berlin Brigade after serving as its Engineer and is now on assignment for the Corps to NASA; Colonel Glasgow is the Commander of the 1st Division Support Command; Colonel Snow is the Commander of an Infantry Brigade. I could go on with a long and distinguished list of Engineers. These, of course, are in addition to those holding key positions with Engineer tinge.

The Commanders of our major military organizations have reason to have confidence in their Engineers. As Governor Al Smith used to say, "Let's take a look at the record":

The 1st Engineer Battalion was the only Army unit of Battalion size to receive a unit commendation from STRIKE command in the Goldfire I Exercise. The 127th Engineer Battalion of the 11th Air Assault Division has been outstanding in its support and the development of -air assault techniques; Engineer units in Alaska were commended for their fine work in the aftermath of the Alaska earthquake last year; the 809th Engineer Battalion is doing an outstanding job in constructing a first class military highway in Thailand, and has been praised by the Chief of Staff; the Engineer units in Korea, even those diluted with KATUSA, are doing excellent work. In Germany, the Engineer units are outstanding with atomic demolitions, on barrier work and with float bridges, all important parts of the tactical commander's plans for the defense of Europe. We have many fine Engineer Units. I have mentioned only a few.

Why is this true? I'll tell you why. Let me give you a few thoughts, gathered over 36 years, which will illustrate why we have a fine organization, and perhaps point the way to the future.

The Corps is what it is today -- and will be in the future -- because of its people and how they are utilized. The very name itself makes the Corps unique among military organizations -- and it is also a clue to the reason. It is the Army Corps of Engineers; not the Engineer Corps or any other blank Corps. It is the Corps of ENGINEERS, a grouping of dedicated professional leaders, recognized as such, utilized as such, and handled as such. Any other handling will not do the job.

We succeed because the people we select are good people. We give them the job and the authority to do the job, and pretty darn well let them do it! This accomplishes two things -- as I see it: It frees the superiors from engulfing, time-consuming details and allows them to do their jobs; and it is a "head-stretching" exercise for those juniors, equipping them for bigger and better jobs with more responsibility. And we have found that the good ones flourish and grow. The alternative can only be over-control, "yes" men and a withering of ability and desire.

Let your lieutenants make their mistakes -- as we all made our mistakes -- when they are young -- but be sure you give them the kind of guidance and assistance that will help them learn from those mistakes: It has been said, "Good judgment comes from experience that itself came from bad judgment." Recognize the great talent that our lieutenants and young captains possess these days -- and utilize it. The talent and education they bring with them are better than we oldsters brought along with us when we joined the Army. Experience is what we can give them, and it must be good, responsible experience. Only in that way can we provide the kind of officer described by our Vice Chief of Staff when I visited one of his divisions a few years ago. "All these commanders want these days," he said, "are second lieutenants with 20 years experience."

The young man today who joins us is "gung ho" for exercising and developing his technical skill. My generation has sold them the concept that science and engineering are the key to their future and the future of our Nation. Now it's our job to show them that a Corps of Engineers career will give them that chance to meet the challenges of a world of exploding technology, but you must also demonstrate for them the necessity of developing leadership, a capacity to handle people and to manage major undertakings. A good Corps officer possesses qualities of leadership as well as technical

ability. These qualities, combined with a management capability, are the keys to success within the Army and outside it as well.

Our job is big and it demands much hard work from all of us. But working harder is not the answer alone -- constantly "working smarter" is much more important. And to that I would like to add: "Never lose your intellectual curiosity." In this day and age, no one ever learns too much. See what other engineers nearby are doing. Somebody may be able to offer information or ideas that will help you in your present mission. If it isn't of any help immediately it will certainly be useful later when you have an assignment in that field.

A moment ago I said our job is big and challenging. I think it's going to get bigger and more challenging in the decade ahead. Many friends as well as foes accuse us of forever looking for more work, of being "work grabbers" and "pork barrelers." There is some truth in the "work-grabbers" accusation. We do, and should, continue to look for work of sufficient magnitude, variety and challenge to build and maintain an organization equal to the task of coping successfully with whatever contingency may arise in peace or in war. Only by such work can we sustain our organization and attract and keep the caliber of people we require. Yes, we look for work, for when the work-load decreases, the Nation loses an essential capability. You might remember this in your discussion among yourselves and with others both in and out of the Army. The essentiality of our civil works to the defense of the Nation has been adequately portrayed, affirmed, and has been confirmed at the highest levels. We aim to obtain enough of this and other work to be in the vanguard of Engineering, and to have a capability to meet the problem no matter what it is.

Often times our friends chide us about our "detachment" from the Army in much of our work. This is not really true. In my contacts with the Chief of Staff and Senior Army Officers, I make the point that the Corps and its work is one of the most effective agents the Army has in the field of public and community relations. We are proud of being part of the Army; we wear our uniforms -- even on Civil Works jobs; and we insist that we be known as the ARMY Corps of Engineers.

In many parts of the United States, the Corps is better known than the rest of the Army. In some areas, the terms

Artiy and Army Engineers are synonymous. This can be said to be especially true in those areas where we are planning and constructing works beneficial to the economy or well-being of the area. I have stated that only two Federal agencies affect the lives of more people than does the Army Corps of Engineers -- the Post Office Department and the Bureau of Internal Revenue, and I dare say we are more popular than the latter.

This contact with the public is of great value to the Army and don't let your Army friends forget it.

We are first and foremost a combat arm, an integral part of the fighting ground forces, and are not only anxious to retain our identity at Corps, Army and Departmental levels, but to make sure that our talents and capabilities are properly utilized. For example, there seems to be a considerable pre-occupation with the matter of "functionalization" these days, and we must be on guard as to application. We in the Corps have no objection to functionalization of supply and maintenance; in fact, we support it. However, this is as far as we can go in supporting functionalization in our work. What could be more functional than military engineering as we now know it in the work of the Corps? Military engineering is a function -- a pure function under one heading that provides an essential "package deal" to the user. To re-group portions of this function outside the realm of the engineer is not functionalization -- it is "fractionalization"!

To eliminate Engineer sections of staffs and to place their responsibilities in other so-called "functional" elements of the staff would break up what I consider one of the purest functional arrangements the Army has had:

I am not going to dwell on the weaknesses that can result from a lack of Engineer participation in the planning and execution of missions, they are many. I will say I however, that many blessings flow to the Commander who has knowledge of his Engineers' capabilities and who uses them wisely -- but he must have someone who can truly inform him of these capabilities and how they should be employed. The Commander must have "packaged advice," directly from the only man whose knowledge is equal to the task -- the Engineer.

The Corps must remain an integral part of the Army. Its troop units must continue to play a dual role of combat and combat support. We in the Corps must also earn and

fill our share of the Branch Immaterial jobs all up and down the line, and we must strive to give our officers the breadth of experience that will pay off in future selections not only as leaders of the Corps, but of the Army and the Department of Defense as well.

I have been talking largely about the uniformed members of the Corps. Remember, in that part of the Corps which I command, we have a marriage of the military and the civilian. It is a remarkably happy marriage. The civilian brings continuity, engineering and scientific skill to the marriage, and provide the bulk of our forces in both contract construction and in geodesy and mapping. Our civilian employees take great pride in being members of the Corps, and a great many of them have their uniforms hanging "at the ready". They do a great deal in training and developing our younger officers.

The military brings to the marriage some important contributions as well. You bring leadership gained through broad experience; engineering and management skills, and not the least important by any means, a change of pace through rotation at frequent intervals that helps to inject new ideas and renewed enthusiasm into the organization.

The Corps of Engineers is a great world-wide organization, but in all modesty, to get a true evaluation of your worth, we have to go back to President Johnson's remarks last September at the dedication of the Eufaula Dam near Tulsa, Oklahoma, and I quote the President: "The building of that dam -- the supervision of that dam -- was by one of the greatest organizations ever known to man -- one of the finest organizations ever conceived and developed by the United States Government -- the Army Corps of Engineers."

Anything I might add to that would be gilding the lily.

At the start of this talk, I mentioned "You Can't Take it With You." However, this is one grandfather who will take it with him. I take with **me** unique memories, satisfaction and friendships that were made in 36 wonderful years as a member of the U. S. Army Corps of Engineers. And to have had the great, great privilege of being your Chief makes me very proud.

APPENDIX B

INTERVIEW WITH LIEUTENANT GENERAL WALTER K. WILSON, JR.

AND MRS. WILSON

PROFESSOR RICHARD T. FARRELL, UNIVERSITY OF MARYLAND

MOBILE, ALABAMA, JULY 21, 1975

A*: You know, I told you how I stayed in a little family hotel in Casablanca. When I returned with my family, I felt I had to take the time to have my family meet the proprietor and his wife. They had been so nice to me for three months. Freddie was about five and we went around to their place. The minute we walked in, they greeted us, then produced a bottle of champagne and everything was just fine. After about 15 minutes, I heard the wife saying in pretty broken English, "You don't want another one," and I looked around and there was Freddie. Quietly, he had drunk as fast as he could. He was really thirsty. He had about five glasses of champagne before we discovered what was going on, and he'd never had anything like that in his life.

A-1: Needless to say, he had a nice afternoon nap.

A: When we got in the car, he sacked out and that was the end of him for a long time, but that's part of the social amenities.

A-1: Well, we had just gone to Atlanta from Mobile. I had to stay in Mobile and let the children finish the fall semester. So we arrived in Atlanta and barely settled there in a brand new house with a new yard--just a lot of mud and you can imagine what they did to the house. Weary came home from Washington and said, "How'd you like to go to Africa?" Africa: It was the last place on earth I'd ever hoped in my whole life to go. That was very exciting. A nice trip over and I thought well, we'll be here a year, and as it turned out, we were over there for two years.

*Responses marked A are those of General Wilson. Those marked A-1 are Mrs. Wilson's replies.

The way life in Morocco is-- just nothing like it is anywhere else in this whole wide world. Their life, their attitudes, their dress, their foods. We had many exciting experiences. We met a Moroccan who had four wives, and he asked us down to lunch often. The first time we went, he said to be sure to bring some guests, so we asked 4 or 5 people. When we got there, he was terribly disappointed because we hadn't brought 25! The food was very exotic. They do not use a knife and fork. They use their fingers, and they eat what they call couscous, which is like a brown rice to us, soaked with a marvelous sauce and cooked with lamb. And the odd part--I'm sure it takes many years of practice to do it--they took a small amount in their fingers and tossed it around and made a perfect ball and then took their thumb and popped it into their mouths. Fortunately, they gave us a very big napkin. You tucked it in the front, otherwise you would have had rice all over you. We lived near the bullring, and we could hear them say, "Ole," "Ole."

A. It was the only place I could find, as I had little time for house-hunting before I had to leave for Washington. I had arranged for the upstairs in a family house in which the lower floor was used as an office. They let us rent the upstairs, and it was only a half a block away from the bullring as she said, music and all. We went to several events there. On one occasion I was the president of the bullfight program. The funniest time was when we went to Torro ball, it was really soccer with a young bull loose in the arena. They had on bright yellow and bright red shirts, and they were playing soccer. A young bull was in there and stopped the whole play by getting in the goal. The goalkeeper wouldn't go back there, and the attack wouldn't run in close enough to the goal to get control of the ball. It was funny as heck.

A-1: We employed Arabs as servants, and they could not speak English. We couldn't speak French or Arabic, so there was a matter of gestures and things.

A. In the first temporary home we had no servants.

A-1: Yes, we did, we had a little boy who always wore his fez when he served. Anyhow, he didn't do so

well, couldn't cook well or couldn't speak well or anything else. So then we had a girl, and she spoke a little bit of English.

A: Then we moved to a very nice house in a better part of town. No screens--fancy living place with no screens!

A-1: You could ride around Casablanca, and you always knew where the Americans lived as they had ordered screens from Sears. What is the French word for dog?

A: Chien.

A-1: I was trying to get across what I wanted for lunch and how I wanted it prepared. Not speaking Arabic or French and the fatima not speaking English, it was quite a chore. So I did tell her one day, we were to have "Chaudie Chien." "No Madam! No Madam!" she said. She thought I really meant dog. She was horrified. Then we moved from there out to Nouasseur on the airbase.

A: Oh, but this house in Casa was in a very lovely area and had a big high brick wall all the way round the garden but there was practically no heat. There was hot water in the kitchen. There was hot water in one bathroom.

A-1: But there was not even a hot water spigot for the kitchen. You can imagine washing dishes in cold water!

A: And no heat, there was one gas burner on the landing between the lower floor and the upper floor. That was the total heat. And we ended up borrowing what we call "little stinkers--little kerosene heaters--that you could carry around. You turned them on until it got the chill off, but by then you couldn't breathe so you'd turn the things off. You either were breathing and cold or not breathing and reasonably warm. Oh! it was something.

A-1: Oh, there were many things strange to us. They were so interesting you forgot all of the unpleasant part and lived through it.

A: Well, I came home from the office on one occasion and got within two blocks of our house. There was a ring of troops as far as I could see. I came to a halt and said, "What's going on?" Well, they're surrounding the Medina, which is the native city, because they were afraid that there were going to be some riots. But the trouble is my house was two blocks inside this ring of troops and two blocks from the Medina. And I finally had to talk my way through the ring, and we kept the doors closed pretty tight that night.

A-1: When we were invited to this Caid's (a Muslim local administrator's) villa for lunch, which was around twelve-thirty or one o'clock, you sat at low, round tables. They gave **you** a huge napkin to put on your lap but no knives and forks of **any** kind. Then a servant came by with a big silver bowl in the center of which was a soap dish. They had a pitcher of warm water in the other hand. You washed your hands with soap, and then the servant poured the water from the pitcher over your hands to remove the soap, and then everyone dried on the same towel.

A: The first time we got involved in this we went to a Fantasia--a kind of county fair. Three of our senior U.S. senators--Duff, Stennis, and Case--were to be the featured guests at this Fantasia. It was an hour's drive from Nouasseur. We drove down there with Colonel and Mrs. Carlson, all of us with our children. We went in picnic clothes since we planned to tailgate lunch. About eleven-thirty, some French officers began coming up and said was the senior American present, and they said, 'Where are your senators?' Well this was in French, but I understood what they were saying, and I said, 'They aren't my problem.' Twelve o'clock came, and they said, "Your senators have not come yet, and it's time to go to the Drffa (meal)." I said, "I'm sorry." They said, "You will have to represent them." Oh I said, "I can't do that, I've got my family here." "Well bring your family." I said, "I can't do that because besides two boys, I have my wife and two daughters." They said, "You must come." So we got in the car and drove up on the hill to a beautiful large tent all decorated with rugs on the ground and small low round tables surrounded by pillows and hassocks. It was jammed

full of about 200 men seated at the tables, and at least 50 servants stepping 'around and over the guests. All the men were talking and laughing when I marched in ahead of my troops, my wife and two daughters and two sons. When we walked in that door and the first female entered, there was dead silence. We were guided to the place of honor where they seated us around a table, and they commandeered a man from an adjoining table to join us. This is when we met our Caid. Apparently he was drafted, because he could speak French. He had served in the French Army as a captain in World War II. He was very colorful and was dressed in a beautiful sheer robe through which his pistol and jeweled knife showed. He did his best to be a charming host but was handicapped because he was the only one who could understand French. I was trying to interpret. The atmosphere in the tent remained strained, but after the handwashing exercise described above, the servants began bringing the food.

- A-1: It was roasted lamb--a complete roasted lamb.
- A• It was on this big tray. Freddie saw something down underneath the lamb that he wanted, and he stuck his little hand down there to get it. It was hot as fire, and he went "Ooooooo" at the top of his lungs. Well, all the men looked, and they all laughed, and that broke the ice. Everything was all right from then on.
- A-1: It was in an arid land close to the foothills of the Atlas Mountains.
- A• As I said, he'd been a captain of the French Army in World War II. A Caid is a kind of hereditary tribal leader or religious magistrate in a rural area. As I stated, you could see his pistol right through his outer robe, and the kids saw them. He was a very charming man, but he spoke nothing but French and Arabic. So I had to try to translate everything. It was tough, but we got by. We had him to our house several times afterwards, and he would have us down there.

He was as handsome as Rudolph Valentino playing a shiek. He was also as charming as he was handsome. They are allowed to have four wives.

Wives never attend any social functions whatsoever. They never go with them anywhere.

Q: Did that cause you problems in other formal occasions?

A: He invited them all, and only the men would come;

A-1: But the women never came, and the wives never appeared when you were guests in their home.

A: He was a good Muslim. He did not drink any alcoholic drinks. Luckily, we solved that. We had parties for him to return favors, and we had the usual things you have. But also we had coffee frappe in a big bowl with ice cream floating in it. I finally could get across to them that -there wasn't any alcohol in it. Boy that coffee frappe would go down in no time at all: It was a fine solution. I like it also,' and since I don't drink alcohol, I helped drink it.

Now his house was way down in the country. We drove about two hours I guess to get there. It was almost down to the mountains. Their guest quarters are in an open court with the rooms all around this rectangular court--kind of a covered walkway--but open to the sky in the center with a beautiful fountain and shrubs and trees, all in the patio. And that% as far in his home as you get. That's the guest court. There the women don't show. He brought his sons in and proudly showed them off. There were about ten or something like that. But we never once met the wives.

A-1: The luncheon was interesting. They started with this roast lamb. It was roasted just beautifully. You reached over and pulled pieces off with your fingers and ate with your fingers. When they had this couscous I was telling you about, then they had string beans that you ate with your fingers. They had what they called a pigeon pie, which was sort of a dessert with layers of very flaky pastry and this filling that was supposed to be pigeon. I thought sometimes it was chicken, but I wasn't sure. It had cinnamon and sugar and all this sort of thing. It would be delicious, and always we wound up with champagne, of course. And you spent hours sitting and enjoying eating this wonderful Arab feast.

- A:** Then **you** moved to another **one** of these guest rooms around the patio and had **your** coffee. And they'd serve more liquor. But what tickled me, I asked the Caid, I said, "Well, how do you like this having four wives?" "Well," he said, "do you ever have any trouble with your wife?" I said, "Occasionally." He shrugged and indicated to multiply this by four. Of course, this was in his French and my pidgin French, but we got along very well.
- A-1: He owned phosphate mines down in his area in Morocco.
- A:** He and his tribe, I don't know what was his and what was theirs. He was well off, but I think he had to go to Paris later on account of the revolution, when the French were ousted, because he'd been too strong a supporter of the French.
- A-1: Well, I think El Glouie was the richest man in that part of Africa and he was definitely not pro-French.
- A:** He was the pasha or chief of Marrakech and had influence over a large area.
- A-1: Yes. So when they came back into rule, he had these men come in and crawl on their hands and knees--the ones who had been pro-French. He had them crawl on their hands and knees and call to him and bow down to him and not until then were they forgiven.
- They also have what they call Ramadan, which is an equivalent to Lent in this country. And they don't eat or drink from sunup to sundown.. Absolutely nothing. But they get up and go to work and go to their jobs.
- A:** The construction was going on.
- A-1: Not a drink of water nor a bite of food, and the sun was beastly hot out there in the middle of the day.
- Q: They continued to work?
- A-1: Yes.

A: Well, you can imagine finding the workmen in all kinds of places, including in the rooms we were building. They just disappeared. They slept in the daytime when they could, and they ate all night.

A-1: We went to dinner one night and there was a Caid there. He had on his beautiful julaba, and they always shot a gun at sunset, which meant that you could eat and drink. Seeing him sitting there, you could see him dying for a drink of water or liquid of some kind, and finally the gun was shot, and boy did he grab a glass of water:

One interesting thing about the Fantasia that we attended, the kind of fair we were telling you about, there were no trees, very few trees then, and they had their tents lined with oriental rugs. The dirt floors were covered also with rugs. If you didn't step in the dirt, you stepped on the beautiful, beautiful rugs. It was quite an experience. I'm glad I don't live over there. When you go in your car, you'd see the families going down the road. The men would ride a donkey, and the women and the children followed walking behind the donkey. I didn't think very much of that.

A: Tell him about the flowers they used to sell you on the side of the roads.

A-1: Oh, the fields were filled with yellow and white daisies, and black-eyed susans, poppies, and flax. I didn't fly over there, but Weary did. He said it looked like a magnificent oriental rug from the air, immediately following the rainy season.

A: Well you see it's very dry except for three months. At the end of that three months' rain, the flowers are knee-high in what was normally dry, flat, hard dirt.

A-1: You wondered how they possibly got through all of that baked soil.

A: They'd pick these flowers and weave them into a kind of bouquet. The stems would be nearly as big around as your two hands could form a circle.

A-1: A cone, it was cone shaped, I remember.

- A: Yes, and all these flowers came out of the top and they'd have a most unusual bouquet.
- A-1: And heavy, oh, it was the heaviest thing you can possibly imagine, but it was a wonderful, wonderful experience.
- A: Were you prepared for some of the local customs? I know you've lived and traveled extensively before, but were you prepared or were you sort of left to adjust on your own?
- A-1: You adjusted on your own, don't you think, Weary?
- A: Oh, we adjusted on our own, and it wasn't too bad.
- A-1: Now, you know, when the families are going to some foreign countries, they have to take a course in that language, but not then. You just did the best you could. It was amazing. We finally had a houseboy, excellent and just marvelous, but he couldn't speak English. I couldn't speak Arabic or French, but by then I spoke "kitchen" French. I finally learned to speak enough kitchen French. I would do a recipe once with him, and that was it. He could do it by himself just perfectly after that. We'd go through gestures, and we'd come up with what I had said that we would have for dinner or for lunch. It just worked out fine.
- A: Well, we hired a yard boy that spoke only Arabic, no French. I figured this was our chance to learn a little Arabic, but he learned English. We didn't learn Arabic. He lived about a mile away in a tent out in the middle of the field with his family, his mother, his wife, kids. He invited us over to his house, for tea I guess. So he proudly led us over there riding his bicycle, and we followed in our car. When we got there, I'm telling you, you have never seen such clean dirt in all of your life. The compound was absolutely bare, but they had a clean floor. We sat down, but none of the family sat down with us. They brought tea and cakes of some kind. It was a treat, and with his native curtsy and so on, really it was very nice. He served us in the best he had and offered his best in cakes.

A-1: It was a charming experience.

Q: What about the PX and the commissary and things of that sort?

A-1: Oh, yes, they had them out at Nouasseur.

A! Yes, we had them also with the construction. A part of the CPFF contract, they ran a PX and a commissary.

A-1: You used scrip in the commissary and PXs, and you used francs in the construction camps and in the local markets, of course.

A: The contractors' personnel were not supposed to have scrip. That as for the military and the government. They were supposed to use local currency. It was a little hairy trying to keep that straight. Then, of course, these construction workers were making good money.

Q: Is it a good place to go about Christmastime?

A: Yes, I'd say so. The rainy season starts about late January, doesn't it, Jeanne?

A-1: Yes .

A: Now, it's not hot at Christmastime. Of course, in the middle of the day, it's very comfortable. They don't have heat. We had my mother visit us over there, and we went up to Spanish Morocco over Christmas. We stayed in a big hotel with high ceilings and no heat and darn near froze to death. The food was interesting--and good.

A-1: They never served dinner before 11 o'clock, and you were just famished by then besides being sleepy on top of that.

A: Plus being cold.

A-1: Everything was quiet in the streets until around six o'clock, and then the populace came out. They walked up and down the streets and chatted and sang and enjoyed themselves thoroughly.

A: My mother would go to bed with everything on she owned, coats, shoes, everything.

A-1: It's pretty country. I also thought parts of Germany were beautiful. Southern Germany was lovely, but the Scandinavian countries; Norway, Sweden, we loved Oslo; we thought it was just beautiful.

A: I'd say October, November, December, and April and May were the prettiest times, wouldn't you?

A-1: Yes.

A: The rainy season would end about early April, and this gorgeous vegetation was everyplace. We skinned off a baseball diamond every year in a kind of a little parade ground here, around the construction area, and played softball. It was utterly, completely burned over ground and the next spring when the rainy season came, it would be knee deep in poppies.

Q: What was the size of the Army's units there? It must not have been too terribly large.

A: Ours, you mean?

Q: Well, yours plus the others.

A: In other words, the Air Force?

Q: Yes.

A: There wasn't anything to begin with hardly. We were building their facilities. It got to be a fairly good size. They were big airbases before we finished, but if we hadn't had the construction contractor there and all that, there wouldn't have been hardly anybody. But there must have been 15,000 of the construction contractor's employees, about a third of them Americans, at basically five locations. So there was a pretty good number.

Q: Did they do any road improvements that would benefit the local economy besides having a military importance?

A. No basically as a result of us being there, the French government itself, or the Moroccan government, improved main highways leading to the five major airfields which would help the civilian economy when it was over. Plus there were an awful lot of people living off the civilian economy. So there was new construction going on all the time providing new housing for the combined American personnel. Also, support facilities sprang up. So the country was built up to a major degree as a result of the effort involved and the number of people.

Q: Well, that's true. That was another country primarily. No, actually this was a big shot in the arm economically to Morocco. It was that much payroll. While most of the Americans didn't live off the economy really, there was still a whole lot of that money that found its way into the local economy.

A-1: There were only a hundred sets of "prefabbed" family quarters out at Nouasseur. That's all they had out here, and we had no telephones. We had one when we first got established in Casablanca, but our friends didn't have one. We couldn't speak French, so we did not use them. When we got out to Nouasseur there were no telephones at all. We just got along beautifully. We sent notes by our husbands to the office, and they would give them to the other husbands. It was a successful operation.

A. It was a little construction village, prefabricated houses and things like that, very comfortable. Some of them were better than others. We lived in one of the better ones when we moved out there. It was a very comfortable house. It had one simple stand-up wall heater in the whole house, but we did have hot water.

A-1: Lots of hot water, which was a **joy**.

Q: Where did you get water during the dry season? Did the Corps have to undertake all that, too?

A: We too, had developed our own water supply and sewer system.

Q: And that would be the same in Saudi Arabia, the things that they did in Saudi Arabia?

A: Well, there were even more problems in Saudi Arabia. Saudi Arabia was just one heck of a lot less pleasant and hotter than Morocco, and utterly barren. Just a wasteland. Now in Morocco, starting with the coast and moving in for about 50 miles, you got a fair degree of vegetation. Maybe when you got to about the 150-mile mark it's just awful dry. But the first 50 miles is pretty well cultivated.

A-1: We used to go up to Port Leyoute, which was the naval part of the U.S. presence over there. We'd go to the resident general's home, which was a gorgeous, elaborate palace.

A: But that was pretty close to the coast, too.

A-1: Yes, but I was going to say that we were invited for lunch, and we discovered the French don't use tablecloths or placemats. They have beautiful tables, lovely wood and all, but not a sign of a mat of any kind. Behind nearly everyone seated at a luncheon table for 25 or 30 people were the Senegalese. They were great big strapping people. They always wore a fez, of course, voluminous sleeves tight at the wrist, baggy pants coming to the knees, and then boots on top of that. You just had individual service. It was a fascinating thing. I'll never forget it. When the Moroccans were getting ready to run the French out of Morocco, we were up there for lunch that day, and the resident general and his wife, of course, were at the head and foot of the table and an aide came in and whispered something to the resident general. Lunch went right on very smoothly, and what the aide had told them was that they would be leaving the minute this luncheon was over and going back to France because he was ordered out of the country: There was not a change of expression on that man's or that woman's face. They went right through the whole business. It was just fantastic to see it.

At night when you went to town, which was not very often--we were 18 miles out of Casablanca when we moved to Nouasseur--the natives would start

bringing by donkey carts of things into what they call sukes, their markets, and they would bring a huge piece of canvas and sit down in front of it and sell their products, beautiful vegetables, perfectly gorgeous vegetables. At night, all these little carts, these were two-wheel carts with a donkey pulling them, would be going down the road; and they would have a lantern tied on the back end, and that's the only way you knew that there was something in front of you. You had to be very careful.

Q: Did that town itself have any street lights or anything of that sort?

A-l: Yes, yes, downtown in Casablanca.

A: It was a European-looking town, the main part.

A-l: They had magnificent hotels. Oh, the hotels were just magnificent. We would go to a big dinner in town. They would make elaborate things such as a basket made out of french-fried potatoes woven in the shape of a basket and filled with more french-fried potatoes. You ate the whole basket. They'd have a pheasant, feathers and all, or they'd have a duck. It would be all dressed up, which was not very appetizing, but it was very interesting. They always passed it around and showed it to all the guests before they served it. Are you traveling abroad as part of your research?

Q: Well, we're going to Italy.

A-l: That is exciting. Going any particular place in Italy?

Q: Well, we'll be at Livorno-Pisa. I guess we'll spend some time in the Naples area, and we're supposed to then go to some of the sites where the Corps has done some work. They specifically want us to go to Saudi Arabia.

A: Taking your wife with you?

Q: Well, I don't know whether she'll go there or not, I may leave her in Turkey.

A: If you get to Ankara, go see the Hittite Museum on top of the little hill in the old city. It's utterly and completely fascinating. They've got some artifacts that go back to 2,000 B.C. from the people in the Bible they talk about; "the Hittites came down out on the hills." And if you get to Cairo, go to the National Museum. Those are the only things I ever tell people to go see. I feel confident everybody will take them.

A-1: Tell your wife to get some Halozone pills because the water is terrible over there. You'll have all kinds of trouble, all kinds of awful tummy troubles if you don't, if you try to drink the water. Just dissolve one in one of those bottles of water.

A: Well, you kind of get tired of drinking nothing but wines. You get a wine bottle. Drink it and refill it with water and put a Halozone tablet in it. Then you can just drink it safely.

A-1: We had a group going from Mobile to Spain to a sister city, and we had told several of them to be sure to get some Halozone pills. They didn't for some reason, and they really had their problems.

Q: Well, that's very good to know.

A-1: You get so you want a drink of water. It's the nicest thing you can think of.

Q: What did you do when your children got ill or something, would you have to take them to the naval facility?

A-1: You mean in Morocco?

Q: Yes.

A-1: Oh, they had a hospital right there and doctors.

A: Well number one, we built one. So as the construction went on, life got smoother. And number two, the contractor had to have some medical facilities right from the beginning, and we were eligible to go to those, too.

Q: Can you recall anything else you want to comment on?

A: well, what really intrigued me, we had a terrible time with the specifications and design of the paint shop. Nouasseur was a base.- I mean not just an airbase but a logistical base. It had a lot of storage space for all the whole Middle East and everything else and a lot of rebuilt capabilities and so on. We started a paint shop. We got it designed and started building it. We got it about half built with a big air tunnel below the floor, and they decided to cut down on the scope.

Well, at that stage in life, we were halfway done. We had all this concrete, and we had all the materials on hand. I said, "The cheapest thing for you to do now is either to stop and forget it, or else build it the way it's designed." But the Air Force said no, so we cut it in half. It took about a year to modify everything else. When i went back there the next time, which was a year or so later, it was complete. It had cost 150 percent of what the bigger one would have cost, and they had two tricycles and a bicycle in there being painted. It's expensive to change your mind. Of course, that whole project had changed its mind with the development of greater range in the airplane, they didn't need it anymore.

Q: Well, how do you account for that--the speed, the decision to do one thing and then changing their mind? Did it have anything to do with Korea?

A: Definitely. You see that's the reason we started it in 1951. But by 1955-1957, Korea wasn't very much of a tinderbox. But the reason that they were moving so fast in the first instance was the fear of Korea expanding and the Chinese and Russians getting in on it, too. But you can't tell. That little magazine article, you know the one you've got. It's got that same Napoleonic sentence in there. "The future of the world depends on you completing these fields.' He believed it, they told him that, and he took it for the gospel. I found out over the years that you have to be just a little bit of an SOB to succeed in that kind of business. If you're too honest and sweet and kind, you just get left out there in left field.

APPENDIX C

INTERVIEW WITH LIEUTENANT GENERAL WALTER K. WILSON, JR.
PROFESSOR RICHARD T. FARRELL, UNIVERSITY OF MARYLAND
MOBILE, ALABAMA, JULY 21, 1975

Q: I am interested in what you remember about your service in the Mediterranean Division. It was established in 1952, and you came in as Division Engineer in 1953.

A: Well, let me see. For a little background, East Atlantic District in Morocco got going about the same time as Greenland. The North Atlantic Division was responsible for both these Districts. And, incidentally, it was supervising me and Mobile to a degree since we were building a classified facility up in Muscle Shoals, Alabama, that was coordinated with one that General Sturgis was building out in the Denver area. Greenland was closer, and also Greenland had the problem of seasonal construction. So it got one heck of a lot of attention from the Division and the Chief's office. I don't think Morocco did.

North Atlantic Division was gradually relieved of some of its excess assignments. The East Ocean Division was formed in Richmond to take over the northern work, and Mediterranean Division was established to take over the Middle East and East Atlantic Districts and the Turkish-U.S. Engineer Group (TUSEG).

The first District Engineer in Morocco was George Derby. I know him very well. He was a cadet when I was. He was two years ahead of me, and there's no finer gentleman in the world. The construction in Morocco was started before it was ready. It was kind of like landing on a hostile shore. What I learned out there did me a lot of good when we were doing things in Vietnam because I could see what was coming but nobody paid much attention then either, so it didn't help. But, through no one person's fault, but just the fact that the management really thought they had to complete certain physical work by that summer in order to prevent some kind of a world problem with Russia and others, they poured it in. They shipped stuff,

took it ashore, without adequate organization yet to receive it. They didn't have any place to put it. They didn't have any warehouses. They didn't have these kinds of things. They could have waited a couple of months and gotten their organization built up and a little storage area. It was very much like, as I say, landing on a hostile shore. Materials were landed and got put out some place, and that's the last anybody saw them for a while. Some of them were probably never seen again. Furthermore, the emphasis in dealing with the contractor was to get the job done. The key thing was there must be planes landing on the 14th of July 1951.

There were several airfields capable of taking some planes by that deadline, but they weren't as well built as normal. There were some little pebbles--several feet in diameter--within inches or feet of the surface of the runway. They had placed fill and rock, day and night. There had been the usual inspection and so on, but there had also been this terrific urge. The fate of the free world depended on getting this ready, and probably that was the true cause.

At any rate, they did land planes there on schedule, and we didn't have any expansion of the Korean War into a world deal, and so maybe that was it, I don't know. But it meant that the contractors' efforts were less than perfect in that they didn't have an opportunity to get staffed and organized and so on. The A-E's [architect-engineer's] work was similar, and people were thrown in helter-skelter and tried to get going and organized. Frankly, that's why they started the Mediterranean Division.

[Orville E.] Walsh went over as Division Engineer to establish the Division, and [Gunnard] "Swede" Carlson and others [went over]. But by the time they got there, the job organization was a group of armed camps. Everybody was keeping his little black book to protect himself. I'm talking now about everybody in the District itself and their key people, the architect-engineer and their key people, the construction contractor combine and their key people, the Air Force command over there, and the French liaison mission. Now you throw

another headquarters on top of it. The District didn't like it worth a damn. They figured they had now gone through the worst. They had gotten over the worst, and now suddenly here's this helpful crowd showing up only 20 miles away to look over their shoulders and step on them. So let's put it that it was not a mutual, pleasant, or happy situation on the U.S. side. I don't blame any particular individual. It's just, you know, when something starts bad, it scares everybody.

In the meantime the Air Force, at this stage in life, was quite interested in doing their own construction and not having the Corps of Engineers do it. This looked to them like a golden opportunity. There were congressional investigations of all kinds. Now this was all going on about the time that the Division was organized, and I think it was part of the cause of organizing the Division. But let's put it that the Chief of Engineers didn't wake up to the fact that the job was in trouble till it was already in much trouble. At that stage, it was not easy to correct.

We had an outstanding group of contractors, and they had some really fine people. We had a real outstanding group of architect-engineers. Unfortunately, they didn't necessarily send as high caliber over there after the initial start as I would have liked to have seen them send, but they still were well qualified. There was an outstanding group of consultants. But this same atmosphere of fear existed throughout. I just know about it from reading into the situation when I got there and from working and talking with many of those who had been involved as I earned their acceptance.

When I was appointed South Atlantic Division Engineer in October 1952, I didn't move my family right away because I didn't believe that after having two Districts in a row and now a Division that I would be left alone very long. But by Christmastime, when they hadn't moved me, I saw Chief Sam Sturgis in Washington and told him I was going to move my family up to Atlanta. And he said, "Sure, you should have already."

I moved them up there about the first of the year (1953), and we rented a house. I went to the Chief's office for a meeting between mid- and late-January and found out Sam Sturgis wanted to see me. I went in to see him, and he says, "You're going to Morocco!" So I left my family in Atlanta and got to Morocco in March or April.

Walsh had been in Morocco I guess about a year when the Joint Construction Agency (JCA) in Europe was getting into some kind of problems. So they transferred him from the Mediterranean Division up to JCA. There was no full-time Division Engineer in the Mediterranean Division for a minimum of six months, maybe longer, but Colonel Carlson was there and so was [Curtis W.] Curt Chapman. Jack Campbell, as senior officer in the whole Division, was acting Division Engineer in addition to his full-time District Engineer job. Then I arrived.

I got quite a bit of briefing and so on, of course, before I went. By that stage in life the top management of the Chief of Engineers' office was convinced that they weren't going to get control of the situation until they got away from a cost-plus-fixed-fee contract on the construction site. Then they gave me very strong indications that I should look very hard and see if there wasn't some way to make such a conversion as promptly as possible. Basically, they gave me a feeling that look, do it unless it's absolutely, positively, definitely not the right thing to do.

I landed there about a week after a team from OCE. It quickly became clear that the staff in the Division, all of whom felt they had been sent over here on a white charger to straighten everything out, had very little respect for the District staff. They didn't trust the contractor, they didn't like the architect-engineer, they didn't like the Air Force, and they wouldn't trust the French Liaison Mission. They knew that they had a terrible bear by the tail because the cost was going up. They couldn't get a handle on it, and they couldn't find out how you control this. On the other hand, the District felt they had been handpicked when they came over, and they had come with George Derby, who was an experienced District Engineer who had recently been replaced by Jack

Campbell, also handpicked. But they knew they had gotten the short end of the stick through some of the early days, 'and they were gun shy.

Instead of being a help, at the moment it really was a hindrance to have these two headquarters there. Remember, on a cost-plus-fixed-fee job, the contracting officer was the District Engineer, and the contractor couldn't do lots of things that he would like to do without getting specific authority. For instance, they had to have a terrific supply setup because the contractor could not say fly me over a bulldozer blade or something if he ran out of it. He had to get the permission of the District Engineer, who would have to justify the cost of flying it versus having thought about it earlier and shipping it. There were just all kinds of personnel problems. The contractor couldn't necessarily fire somebody because under the CPFF thing, the government had an overseeing responsibility on top of it. So the many, many normal quick routes to straighten out something like this weren't easily available. The District Engineer had to think in these terms: "Now, we are accused of all this business and mismanagement. If I make the wrong decision here, who's going to get hung?" The Division staff in turn were there, and as long as they're there they had a responsibility, too. So, it wasn't too good.

I immediately started my staff in making an analysis as to whether we should convert this from a cost-plus to a lump-sum-type arrangement, and they worked on it pretty hard. Colonel Chapman was spearheading it, and of course we had some well-qualified civilians there too, and they worked on it. But along about the first of May they reported to me. We had about a whole-day session while they reported, and they conclusively demonstrated the impracticability of converting. It would have to stay CPFF. It was not realistically practical to convert in a situation of this magnitude. This was a sincere report, so I turned it around and said, "I surely appreciate it. This was the finest analysis I have ever heard of this nature? I said that I was going to leave for a three weeks' trip to inspect the other areas in the Mediterranean Division: Tripoli, Eritrea, Saudi Arabia, and TUSEG. I said, "I'll be gone about

three weeks. When I get back I want to see just exactly as thorough and outstanding-an analysis as you just presented to me, but I'd like to have it pointed out that it could conceivably be a good idea to go in and try this conversion. This might be a way of getting out of our problems.'

This was somewhat of a blow and a shock to the assembled staff, but by golly I came back and they had it. Now, I'm sure they weren't convinced yet, but it did put a different slant on things. After we talked about it and reviewed it for about two weeks, I had at least gotten the top element of the Division to agree with me that there could be advantages to conversion. So Colonel Chapman and I went back to Washington about early June. We in the meantime had tried to figure out how much money we needed. We spent about three weeks in the Chief's office and in the Pentagon. We got with the Chief's office, and they concurred finally that we should try and convert. Then we had to get permission from the Secretary of the Army, and all this took a lot of doing. We had to get a certain amount of money. I don't remember the exact amount, but it was up in the millions; and we needed it right now, you know, to cover our deficit on the work already under contract. Near the end of June I picked up my family and took them to New York, and we rode the transport over to Casablanca.

I got a few days of rest. I came with an authority to convert if I could convince the contractor that it was in his best interest as well as ours. And I had--I've forgotten exactly how much--about 5 to 15 million bucks we had gotten in order to be solvent. Well, they met me at the gangplank; Colonel Carlson, Chapman, and others. They took me aside and said, "We're sorry to tell you, but you need 10 million more than you brought." "Well," I said, "who have you told?" And he said, 'Nobody,' and I said, "Don't. The only one that's going to know it is you and me and let's try and sort it out first, before we say anything. I'm not going to even think about going back, saying we were wrong by 5 million bucks. At this stage, we may have to, but we'll never do it now."

So then we went and got into high gear, and we met with the contractors. I became completely

convinced that the contractors' management wanted to have a clean job that they could be proud of. They also felt that their chance--and our best chance of getting near true management capabilities--was to convert it, to get off this cost-plus instead of having a committee rule. We thought, "Let's give them the responsibility and let them do it." But then our big problem was how do you convert a going contract with major work at five major airfields, plus numerous lesser facilities scattered around in radar stations and things like that, all of them under construction, all of them constructed under cost plus a fixed fee? We were working around the clock, overtime, everything you can imagine. Materials were arriving daily, lots of materials. How do you estimate what to set as a figure on a particular moment at midnight on the last day of July? Well, as you can readily see, this is some problem. But again, I was convinced that the contractor forces wanted to do it in order to improve the efficiency and costs of the job.

Q: Were most of these contractors American firms, or were they European?

A: Well, the Atlas combine was an American firm. There were five major contractors from the U.S. that had combined to form Atlas constructors.... Their management committee was the head man from each of these five firms, and they were over there for this purpose. The sponsor was Morrison-Knudsen. On all these things they always have a sponsor.

They were scared. They were concerned. They didn't like what had been going on. They wanted to try and get it straightened out so it could be a better job. One that they could get some good reputation out of instead of a lousy reputation. But they felt, as did I, that if we could convert, it might give a handle we could get hold of. I was convinced personally that the only way to make it a success was to be darned sure that I succeeded in allowing enough money in the contract so the contractor was not going to have initial fiscal problems. But I felt that I could convince them that they couldn't keep excess profits because it was under the wartime renegotiation regulations required with any cost-plus contract.

I promoted this idea privately with the head man of the combine. I said, "I want to try and see to it that we come up with a price which you can live with, but I'm going to expect you to come back and hand me money anytime you can because then I can crank that into additional authorized construction and that will be a legitimate base on which you can draw legitimate profit. So I'm going to try and get you down to a price that I think is realistic, but I'm sure going to try and see to it that we don't start off with you in financial trouble." So these were our two attitudes.

But there were thousands of people working on this thing and you can't go around telling them all this. I'm convinced most of the government employees over there thought I was on somebody's payroll. They thought I was giving away our shirt. When we started our negotiations in the latter part of July, Jack Campbell was the District Engineer, so he was the contracting officer and had to run it. We did them day and night, and I mean day and night. We got very little sleep. All of a sudden, it dawned on me that Jack was about cracked physically, and I got concerned about it.

Incidentally, the Chief's office had sent over a team with Dave Tulley, the new assistant chief of engineers for military construction, and he was there with a special representative of the Secretary of the Army with authority to approve or disapprove. We had to have this authority on site, we couldn't fiddle around and go back and forth. So I talked with them, and they had noticed the same thing. They were just sitting in listening all this time. They agreed Jack just couldn't make it physically so we put him to bed and I took over, which was not the nicest or easiest thing to try and do either. But, in order to make a long story short, the contractor was talking in terms of \$45 million before he even wanted to talk to us about work--the current contract--and the nearest figure that I could get out of anybody on our side was about \$21 million.

I had worked hard with Swede [Carlson] and Curt Chapman and our civilian staff in the Division and got them up to a figure that was over \$20 million. They didn't like it. They thought it was too high,

but they accepted the fact that it was a negotiating figure. To make a long story short, we finally settled on \$32 million, and I told the contractors that I wanted them to know that I realized this was too high, but I was going to accept it. I said, "I'm going to recommend that we get approval of the Secretary of the Army because I think it's the only way we can get going. I'm convinced you can do the job more efficiently if we quit having this committee system, and I'm expecting you to come back in the middle of October and offer us back some money which can then be cranked back in because I can assure you, if you make any excess profits, I'm going to lead the team that analyzes you and see that we take them away?"

* * *

As a result of our conversion to a CPFF posture, something on the order of 4,000 Americans left fairly promptly. I can't be sure of these figures, but there was a tremendous exodus within the first 30 days of conversion. One thousand or more of them left right away. How could they do it? Well, real easy. They no longer maintained this supply record, as such. They went on a basis of when they got supplies, here they are, if they're needed on a job and a guy shows up with proper authority, he can have it. We won't need anywhere the size staff we've got here. Furthermore, we'll order in advance on major things that we know are needed. On a lot of little odds and ends, we'll wait until we see if we use up all the stock we have. If we run out, we'll fly something over. So on that basis, and that was an honest basis, there was a terrific exodus of fairly high-priced U.S. help.

Now the same thing applied to some extent to the technical side because when you're on a CPFF thing, you've got yourself, the contractor has himself, and he's got somebody looking down his throat every minute so he has to have a good qualified technical man there watching a good qualified technical man do the work. And then the architect-engineer is going to have somebody sit in there too because he wants to be sure it's done right. Then the government is going to have somebody sitting there too. But without these requirements any longer in effect, the contractor's work force was pared

materially. Under the cost-plus basis, we had to approve the local hires. We had to approve the subcontractors he got. When he became his own prime contractor, he could do a lot of this. He could put native drivers on equipment at his own risk without us having to be utterly and completely convinced that they were duly, fully qualified and all this kind of thing. So there was a major change.

To everyone's amazement --including Dan Teters, the contractor's top man who had been captured on Wake Island and [who was] a prisoner all through World War II, a heck of a fine guy--progress picked up using fewer people and produced greater profit. By the middle of September, Jack Bonny and his group came back for another visit. He came in to see me and said, "I've got \$5 million I want to return to you right now." This was after 45 days, and I said, "Jack, I appreciate that because I think it ought to be about 15. I've been watching, but I'll take the 5, and I'll say no more because I'll expect to see you again in the middle of October." And that's the way it worked. We renegotiated those lump-sum figures we had originally established about three times over the next three or four months. Authorized additional work was added on a much more realistic cost basis to the contract. We had a big renegotiation along about the middle of November.. We nearly had a parting of the ways.

The contractor had established Lyman Wilbur over there in addition to Dan Teters. Dan Teters was resident manager, but Lyman Wilbur was the resident partner. Lyman's job at this stage really was to keep track of this business and get ready for negotiations. About the middle of November they came back with their management committee--Mills and Teters, someone from J.A. Jones, I believe, all of them. We had a long negotiation. It was supposed to last about a day. It started about Sunday. Lyman Wilbur had analyzed every single operation. It was a pile of material about a foot thick in about two or three volumes. I had gone over it myself personally, and I couldn't find a single place that I could quarrel with. It was a beautiful job. He's an outstanding estimator, but he also is a complete perfectionist. He estimated

every element so there was no chance of their being wrong in any little steps. When you added them up all together, I knew it was too high.

Now the best way we could figure these estimates was to figure how many people would be required for each feature and that was the real key to figuring what the cost would be. So they put these books of the estimate there, and we discussed it. There were 15 to 20 people sitting around the table, and I kept trying to find fault with little items here and little items there and my people did and studied it pretty thoroughly. We weren't getting anywhere, and I finally said to Jack Bonny, "I would appreciate very much if you would go back to your office now and read this thing." Well, he said he would. This went on twice, through Monday and Tuesday. Finally Wednesday morning he came in and sat down at the table and he said, "Well now, we decided to let Lyman be our spokesman this morning, so what he says goes." I said, "Fine." And Lyman put his hand on these big books and says, "This is it. Take it or leave it." And I said, "Well, Lyman, since I have been told that you are the spokesman, I appreciate what you're saying. It's been nice working with you and your people. I have a lot of respect for you, but that concludes the negotiations. We'll hire a new contractor."

This caused a certain amount of excitement, and Jack Bonny spoke up promptly and said, "Wait a minute, wait a minute, let's don't be hasty now. We'd like to have a little chance to get together a little more yet before you take a step like that." And I said, "Jack, you can have as long as you want, but you told me he was the spokesman, and he just told me that's it-take it or leave it, and I leave it. We don't want to change contractors in midstream but we sure will." And he said, "Well, let's have a little break." So right after lunch he came back, and he said: "I'm sorry. I've now spent three hours going through that book in detail; and I haven't finished it, but I now see what you were trying to tell me all the time. I talked with Lyman, and I know what you were talking about. If you'll give us till tomorrow morning, I'll come back. Why don't you and I sit down and estimate this thing?" I said, "all right, we can do it as well as anybody else can. it's just a

matter of judgment." So he came back Thursday morning and sat down with that book, and we went through page after page. I'd say, "Well, I think that% too many people in this job and that job and this thing." He'd say I 'All right, I accept that.' So we just arbitrarily cut them, and we got clear through. We had made a heck of a cut. I said, "Jack, I'm sorry. I'm not satisfied.' He said, "You mean you still want to take more cuts?" I said, "No. I'm scared we've cut too much. I want to go back and put a little bit back in 'cause I don't want you to be hurt right at the start and get a discouraged job. I want a good job."

So we went back and added a little bit back in and agreed on a total which was a tremendous change from what had been presented. Then we got the group back together and met, and they accepted this. And I said, 'Now, just for the record, this is a pretty good price. I'm proud of it, but there's still more in it than is necessary, so there's going to be an opportunity for the contractor to bring some more back.' If I remember correctly, they did.

But that's the system. That's the way it worked. It worked primarily 'cause of the basic difference between the two systems--under cost plus a fixed fee, the government agent is a partner. He has to approve every decision. For various good reasons, good reasons for controlling materials and not letting them get lost and so on, and then protecting the government's interests and so on. There's a very extensive logistical system which takes a lot of people to make it work. When you get a lot of people to make it work, particularly in a foreign area, you then have more workers and that means you got to have more camp support. You may ask why do you ever go to a cost plus? You go to a cost plus because you don't have your plans ready, you don't have your materials available. You want to keep working while you're developing these plans and getting the materials and so you can't do anything else. So you're forced into it. But once it's stable, once you know what you really want, once you've got your plans in pretty good shape, it's sure cheaper, in my private opinion, with a good honest contractor, to give him the responsibility with the government inspecting and

making sure that he does the job properly. The contractor can cut out all this extra staff that CPFF requires, and you can reduce the staff of the government side materially also. Again, that's what happened with us.

In November 1954, East Atlantic District was consolidated with the Mediterranean Division, and we moved out to Nouasseur. That's just about the time I'm talking about that latter negotiation. The first thing we did, we phased out the architect-engineer contract to a major extent and hired some of his people on the government staff. We kept only one engineering organization. It belonged to the District, which reduced duplication. By then, we gradually melded the Division and the District into one, and we had a very small element of the Division that concerned itself with the Middle East District. At that stage it was still--well, I guess by that time, TUSEG had been taken away from us, that's right, it had. So basically, everybody in the Division office was also in essence doing the extra job that the District had had, but there was a small group of programmers, engineering review, construction supervision that tried to stand a little bit above the Moroccan scene and do normal Division functions in the Middle East District as well as kind of an overall overview of what was going on in Morocco. But that in itself resulted in a tremendous saving of bodies. I think it was well worth it.

Now again, I'm utterly convinced we couldn't have changed the government's side materially until we got the contractor's side reduced in size. We couldn't have done that unless we had converted the contract to a lump sum and fixed price. We couldn't have done that without a cooperative, honest contractor that wanted to make the job work out well. He was more concerned with that than getting an extra nickel. He wanted to get his profit, don't get me wrong. He was entitled to his profit. But he was also concerned if there was a question of doubt as to whether something was legitimate or not. I don't mean legitimate but whether it should be charged off against their profit or whether it was a real cost. He would accept my judgment right off the bat. He'd say, "OK, if you don't think that belongs in our cost,

why we'll take it out of our profit." And that was the only way we could possibly have brought it under control.

Now, as I told you a while ago, I'm convinced that most government employees and many of the military personnel felt I was on somebody's payroll or getting a payoff or something to begin with. I mean even the way they looked at me, I could see it. But within six months, we had a happy situation. Our effort could be devoted to doing the job technically well rather than to going around putting out fires and trying to stop them.

We still had problems. The Air Force was still gunning for us. I kept talking to the Air Force command in Morocco. I had to report to him. He was the senior military person over there. He'd pick up a rumor from some place and immediately go to the Pentagon with it, to the Air Force. And the Air Force would blow it up there and go to the Chief's office, and the next thing you know here we have a full-blown conflict. They were not the smartest people in the world though, because, as I kept telling the man, I said, "If you think you've got something that we're not doing right and you want to ask about it, call me. Or, I'll come up and see you and tell you because everything you've picked on so far, you're absolutely wrong, and I've been able to convince people that your rumors were incorrect and so it's just taking time and effort on our part." Just between you and me and the gatepost, there were things that they could have caught us on with no question. We were slow working out of all this, but at the end of six months, I wasn't concerned with anything. I told the Chief's office, "You can send any investigators you want now because we're ready. We're in solid shape.'

As a matter of fact, one of the reasons that we were able to get by without that extra money that I mentioned way back was that by thorough analyses, we found over \$5 million worth of equipment--materials that had been put into camp facilities and other things which were supportive--and we went around and earmarked things that were in the camp facilities that would ultimately no longer be required in those places

and could then be reinserted into the permanent facilities and thereby reduce this cost. Basically we recovered the \$5 million worth of materials that they had told me that we were short when I returned. I wouldn't say no one was stealing in a foreign country with light-fingered people. Sure there were things that disappeared, but the bulk of this was strictly a case of getting the job done and somebody in the system missed a point.

There were things like generators, kitchen equipment, major things, that we had used in some of the facilities built to house contractor personnel that were ultimately converted for use by the Air Force personnel, which was their real purpose. I do know that they did the same thing up in Greenland at a later date, a whole year or so later. They came over and got with us to find out how we handled it, and I think it paid off up in Greenland too. But I'm completely convinced we did the right thing.

I'm not trying to say that we were any smarter or any more astute or any better technically or anything else than the people that were there before us because we had been forced to get going before we were ready. We'd have had the same problems. You can't help but use a cost-plus kind of contract in the early days of some activity when there isn't sufficient time and means to get the thing done in the normal manner. I've found this out on quite a few cost-plus jobs in my life, and yet I can't fault the fact that under the political and international circumstances that have existed in each case, a cost-plus job was essential in the early stages in order to get going.

Q: Did you have any direct relationship with foreign governments? Did you have to worry about that side of it as well?

A: Yes, to a degree. We worked it through the consuls primarily. But like in Morocco there was an organization called the French Liaison Mission that represented the French and, yes, they were very positively a part of this. All of our real estate dealings had to be through them. We had radar stations and communication systems that were scattered around. All that stuff had to be done

with their approval. Any contracts or subcontracts we made with French or Moroccan or foreign firms had to be worked through them, getting their complete approval. We hired foreign nationals to some extent going down the line. And those all had to be approved by the French Liaison Mission. We were involved with the French resident general, who was really governing Morocco, and there was a sultan. But the Frenchman was above the sultan. The French Liaison Mission reported to the resident general and the French government in Paris. The French Liaison Mission was headed by a colonel-type from the French Engineers, and they had a staff and they reviewed all these things.

Now the same thing was true in Tripoli. The Middle East District primarily did the work there because our Division personnel weren't there very often. The same thing was true in Eritrea where I had to go down and call on the emperor of Ethiopia on a visit to Eritrea because it was a province of Ethiopia. I've called on Saudi Arabian rulers at management level to some extent. I didn't do any more than I had to. In Turkey the same thing. I paid courtesy calls on the Turkish government whenever I'd go over there, and our TUSEG group had to work very closely with them because what you could do and what they wanted done and where you could do it and how you could do it and how you could get people out of jail--all those kinds of things were very definitely worked out with the Turkish government with occasional assistance from our U.S. embassy staff.

Now we had a problem with money. We had what we called "funny money" or scrip. There was no U.S. money in Morocco itself. The Air Force had it too. This was a logical thing. Gradually over a period of time the scrip began to take on real value, and then gamblers got on to it and so on and so forth. So every so often they just closed down and collected all the scrip and replaced it with a new issue. That gets you into contact with the foreign government and the Air Force and the customs people and every other thing you can imagine.

I had a very interesting situation. I had a provost marshal working with the Air Force, and he

had raided a pretty-good-sized gambling operation that was taking place on one of these sites and had seized somewhere between \$8,000 and \$15,000 worth of scrip that was being used in the, card game. Now the contractor types were not permitted to use scrip and hence deal with the military types. It was an interesting situation but this was very much verboten, and we tried to break them up as much as we could and here we picked up this guy. Here was his money that was seized for evidence. All at once, one day, we get word. The gates are closed. Turn in your funny money. Now that meant my family, who were still living in Casablanca. I was at Nouasseur. They had some scrip, not much, but they had French money too to spend in the local community, but I had to estimate how much money they had at home and put it down and get it as quickly as I could and trade it.

Out at the airbase where the construction was going on, the contractor personnel were paid in Moroccan francs, but it suddenly dawned on me that we had this man's money in the safe. He was in jail some place. It dawned on me that come tomorrow that money will be good evidence, but it wouldn't be worth a nickel. So I got in touch with the provost marshal, and he was very happy. He said, "Well, we won't even have to find him guilty. We'll just forget it." I said, "No, you're not. We've got to do something about it." So, much to his disgust, he had to arrange to get all that money marked and take it to the finance people and get us, in essence, a check from them for that amount of money, and all the certifications you had to put on so that you could hold the check good at a later date once the case was taken care of. But this again would involve the French. In other countries they had some of the same problems, although it wasn't as much in some of the other places. There just wasn't that much use of scrip. We had the U.S. consul in Morocco, and socially we had to maintain good relations. I told you earlier about these people that had problems from an accident that fortunately wasn't their fault. But that kind of problem could arise all the time. When you had all those things to worry about and you had to deal with them and you picked up any native people with any suspicion of anything, you had to turn them over to the local authorities for trials.

Incidentally, it took a lot of awful hard work to complete the construction program. But the final result was outstanding. We beat ourselves over the head with a hammer in order to make it feel so good when we stopped. But we had a program of testing all the pavements--airfield pavements--with heavy rollers. The heaviest I'd ever seen at that time. In all truth we rolled them so long that we should have taken useful life away from the pavement. But if there was any giving in that pavement, we tore it out and did it over again. We did it far beyond my personal feeling of how far we should go, but the experts all said this is what you've got to do, and so it was done. People would stay out there in that hot damn sun and sit and look. I've sat and done it for hours, and it got to where I could see the pavement moving up and down whether it moved or not. But anyhow, this was done. The work was all corrected. It cost something, but ultimately we've turned it back to the Moroccans. The quality of the work, well it improved. Rapidity of work improved. The cost of the work dropped. The materials could be a problem. There had been a change in what was going to be built. To start with, everything was going to be lumber, the barracks and everything. So all this terrific load of lumber--my God, we had a lumber pile that was out of this world!

Q: Were decisions like that made in the Office of the Chief of Engineers or were they made by the contractors?

A: Those made basically as a program thing would come out of the Air Force headquarters and the Chief's office. The initial decision to make lumber frame barracks and so on was accepted by the Air Force, but then they decided that it wasn't the best thing later on. But all this lumber had been ordered. Here we were. We had one hell of a lot of lumber. And we got some prefabricated huts that we were worried about, and we tried worldwide. We shipped some of that stuff all over. Then we had a lot of our own equipment that gradually was working itself out of a job. The amount of heavy equipment could not be planned and executed truly economically because all five airfields were required at the same moment. So you had to buy equipment to build five airfields.

Now, as you go along and the work begins to peter out, you begin storing this stuff. OK, well you store it. And it costs money to store it. And if you don't store it properly, it goes bad. There was a pretty good little expense involved in that. Now, as far away as we were from the U.S., in Atlas we had a very fine rebuild capability and fortunately for us, the Air Force decided on this big program in Spain. They weren't about to try and get us off the hook down in Morocco. But they couldn't get equipment. They couldn't get supplies as quickly as we could furnish them, so we turned into quite a wholesaler. They had a mission to come down and pick the equipment they wanted. And we put it through the rebuild shops and sent them outstanding rebuilt equipment. Of course, it was all Air Force money, so this was a help to the Air Force. It was a help to U.S. funds.

I got nothing but compliments out of the people in the Navy that were doing the construction in Spain, and they were kind of afraid we'd slip them all the dogs. But it was done, and we insisted that they have inspectors right in the Atlas plant so they could make up their mind on each piece. Whether you replaced or repaired it or rebuilt parts, that was a decision of the future owner standing right there. And it was going to cost him one way or another. They also took most of the lumber off our hands. They could use it, and it was the quickest place they could get it.

So this all went into this recovery of the five million bucks I talked about. This all was a saving to construction funds in Morocco. It could go into more work because there were lots of things, as these years went by, the Air Force wanted added to expand their program. And this is one of the ways of getting the money to do it. But there were all kinds of things that moved up there. Also there were military activities in Europe, came down with shopping lists and got equipment and supplies at somewhat of a reduced rate and of course it was a saving to our funds not letting them sit out there.

Q: How were decisions made between whether or not it would be the Corps that actually did the construction?

A: Well, that would be down at the Department of Defense (DOD) level. That's my opinion. And we had a lot of dealings with the Department of Defense. When I went back to get this extra money and so on, and when I went back to get authority to go to this conversion, I had to sell it not only to the Secretary of the Army but up at the defense level also. The Chief's office would want the job, and the Navy would want the job. So DOD made the decision.

Q: When was the complete headquarters moved to Livorno?

A: I was deputy chief of engineers at the time MED Division moved to Livorno and had helped get approval for them to do this. I lived the first six months in Casablanca. Then to save money and reduce the size of everything and to get it to where I could get people together after this conversion sometime that fall of 1953, I moved our Division office into the District's office building in Nouasseur when so many people had been sent home that there was office space available. Then my family moved out and lived in one of the construction quarters there and got out of town. And then of course by 1957 they reestablished the District in Morocco in order to leave the Division free to move to Italy.

Q: Do you have any concluding remarks?

A: I can't overimpress you with the fact that it was an extremely unhappy job when I got there. Not due to me, but just the way the changes took place; after about six months or so, it was probably the most pleasant assignment I've ever had. It was far enough away from the throne not to be looked at every minute. People were cooperative, friendly, and everybody worked together to get the job done. There was very little, after the six months or a year, there was very little real nasty bickering as between the government's side and the contractor's side or between one office and another or between the Army and the Air Force. It was a happy, pleasant feeling, and frankly that's the way to get things done.

NOTES

[The rank given in the notes is the highest rank attained. Career assignments are a representative sample and are not meant to be complete: For further information on West Point graduates, see the Register of Graduates and Former Cadets, United States Military Academy, published annually by the Association of Graduates.]

1. The interviewee's father, MG Walter K. Wilson, Sr. (1880-1954), graduated from the USMA in 1902 with a commission in the Artillery Corps. He served on the War Department General Staff (1917-1919), as an executive officer at West Point (1929-1935), and as Commander, Western Defense Command (1940-1942). After retiring in 1944, he immediately returned to active duty as Director of Army Emergency Relief, a position he held until his "second" retirement in 19510
2. Geronimo (1829-1909) was an Apache warrior who led raiding parties to protest the forced removal of his tribe from their Arizona reservation. Captured in March 1886, Geronimo and his followers finally ended up at Fort Sill as prisoners of war.
3. In military slang, "Manchu law" refers to a law or regulation designed to require active service with troops and to prohibit lengthy assignments to desirable positions or locations.
4. LTC John N. Wilson (1913-1944), the interviewee's brother, graduated from the USMA in 1935 with a commission in the Field Artillery. He commanded the 219th Field Artillery Battalion of the 35th Division and was killed in Normandy in July 1944.
5. William L. LaFollette (1860-1934) served as a Republican in the House of Representatives (1911-1919). Robert M. LaFollette (1855-1925) was governor of Wisconsin (1901-1906), U.S. senator from Wisconsin (1906-1925), and an unsuccessful candidate for President in 1924.
6. COL Charles Keller, Jr. (b. 1908) graduated from the USMA in 1930. He commanded the 1135th Engineer Combat Group, Third Army, European theater of

operations (1944-1945), and later became Engineer of the VIII Corps, Third Army. His father, BG Charles Keller (1868-1949), graduated from the USMA in 1890.

7. Because of a shortage of men needed to garrison its stations both in the United States and overseas, the Coast Artillery Corps placed Fort Rosecrans in a caretaker status in 1922. The 28th and 115th Companies of the Corps were stationed there at the time Wilson, Senior, took command.
8. Fort Ruger is located on the slopes of Diamond Head on the island of Oahu.
9. Established in 1908, 25 miles from Honolulu, Schofield Barracks served as an Army training camp and was the site of an officer candidate school.
10. The reference is to Wilson's classmate, COL Horace F. Sykes, Jr. (b. 1907), who served in the Panama Canal Zone (1939-1943); in General Headquarters, Far East Command (1945-1948); and as a member of the National Munitions Board (1949-1952).
11. LTC Walter K. Wilson III (b. 1937) graduated from the USMA in 1960 with a commission in the Infantry. He later transferred to the Corps of Engineers. He served with the Military Assistance Advisory Group in China (1967-1969), and was on the faculty of the engineering department at the USMA (1971-1975) before moving to Louisville Engineer District as deputy district engineer (1975-1978). Since 1980 he has been the Engineer at the 21st Support Command installation in Manheim, Germany.
12. LTC James T. Barber (b. 1904) entered the Coast Artillery Corps upon graduation.
13. The reference is to GEN Omar N. Bradley (1893-1981), a classmate of Eisenhower, who graduated from the USMA in 1915. During World War II Bradley commanded II Corps in Tunisia and Sicily, and the First Army and 12th Army Group in the ETO. He went on to become Chief of Staff, U.S. Army (1948-1949), and Chairman, Joint Chiefs of Staff, U.S. Army (1949-1953).
14. MG Edmund C.R. Lasher (b. 1906) served in the Office of the Quartermaster General (1939-1942),

the Office of the Chief of Transportation (1942-1944), and as Commandant, The Transportation School (1952-1954). He retired in 1958.

15. COL James J. Winn (b. 1907) served as Commander of the 955th Field Artillery Battalion in the ETO (1944-1945) and as a member of the Korean Military Advisory Group (1953-1954) before retiring in 1959.
16. MG Frank D. Merrill (1903-1955) commanded "Merrill's Marauders," a composite unit of 3,000 volunteers that infiltrated enemy lines in Burma and won all of their 5 major and 30 minor engagements in 1944. After the war Merrill served as Chief of Staff, Tenth and Sixth Armies before retiring in 1948. He was Commissioner of Public Works and Highways for the state of New Hampshire from 1949 until his death.
17. As an infantry officer, COL Charles N. Hunter (1906-1978) commanded the 5307th Composite Unit in the 'China-Burma-India theater. Later he served on the faculty of the Armed Services Staff College (1951-1954). He retired in 1959.
18. GEN Frederick H. Smith, Jr. (1908-1980) became Commander in Chief, U.S. Air Force, Europe (1959-1961), and Vice Chief of Staff, U.S. Air Force (1961-1962).
19. LTG James M. Gavin (b. 1907) commanded the 82d Airborne Division (1942-1948) and was Commanding General of VII Corps, Europe (1952-1954). After retiring in 1958, he served as ambassador to France (1961-1962). GEN Paul D. Harkins (b. 1904) was Commandant of Cadets at West Point (1948-1951) and served as Commanding General, Military Assistance Command, Vietnam, and Military Assistance Command, Thailand, for his last two years on active duty (1962-1964). GEN William F. McKee (b. 1906) held several key staff positions in the Air Force before becoming Vice Chief of Staff in 1962. He served in that post until his retirement in 1964. MG Robert W. Ward (b. 1905) served in Europe and the Mediterranean during World War II. His last assignment was as Chief of Staff at Headquarters, Allied Forces Southern Europe (1960-1962). MG Alvin G. Viney (1905-1962) was Deputy Commanding Officer and Chief of Staff in the Advanced Section, ETO Communications Zone (1944-1945), 7th Army

Engineers, Europe (1952-1953), and Deputy Chief of Engineers for Military Operations, OCE (1957-1959). BG John L. Person (1907-1968) held several positions in OCE (1941-1943), including Chief, Military Construction Branch. He then served in the ETO and was Commander of the Military Pipeline Service and Deputy Chief Engineer of the theater (1944-1946). After the war he was Louisville District Engineer (1948-1950) and Ohio River Division Engineer (1954-1956). He completed his career as Acting Assistant Chief and then Assistant Chief of Engineers for Civil Works (1956-1959). GEN Paul L. Freeman, Jr. (b. 1907) became Commandant of the Infantry School and Commanding General, The Infantry Center (1958-1960), and was Commanding General, Continental Army Command (1965-1967).

20. BG George A. Lincoln (1907-1975) served as professor of social sciences, USMA (1947-1969) and as chairman of the department (1954-1969). After retiring in 1969, he headed the Office of Emergency Preparedness until 1973. His younger brother, LTG Lawrence J. Lincoln (b. 1909), graduated from the USMA in 1933 and was known as 'Little Abe.' But George Lincoln was actually smaller than his brother, hence, Wilson's observations about the elder brother: "'Big Abe' we called him, although he was 'little Abe.'"
21. BG William A. Mitchell (**1878-1941**) graduated from the USMA in 1902 and served as assistant professor (1907-1911) and professor (1922-1938) in the Engineering Department at the USMA.
22. COL Gerald E. Williams (d. 1949) graduated from the USMA in 1931. He commanded the 391st Bombardment Bomber Group in the European theater (1943-1945).
23. COL William D.A. Anderson (d. 1934) graduated from the USMA in 1904 with a commission in the Corps of Engineers. He was Assistant Commandant and Commandant of the Engineer School (1924-1928) and District Engineer, Mobile (1928-1932).
24. COL Benjamin C. Fowlkes, Jr. (1903-1978) graduated from the USMA in 1925. He was Commanding Officer, Granite City Engineer Department (1950-1952), and Commander, 7th Engineer Aviation Brigade (1952-1955).

25. MG Stephen R. Hanmer (1910-1973) graduated from the USMA in 1931. He served as Commanding General, Fort Belvoir (1961-1962); and Chief, Office of Personnel Operations, Department of the Army (1962-1964).
26. MG Campbell King (1871-1953) graduated from Charleston College and later from the Infantry and Cavalry School in 1905. He retired in 1933 following his last assignment as Commandant, Fort Benning.
27. MG William A. Carter, Jr. (b. 1907), graduated from the USMA in 1930. He was Engineer, First Army, ETO (1944-1945); and Governor of the Canal Zone and President of the Panama Canal Company (1960-1962).
28. BG Bruce D. Rindlaub (1904-1959) graduated one file behind Wilson in the class of 1929. During World War II he served in Headquarters, Services of supply (1944) and as Engineer at the New Guinea Base Section, Southwest Pacific Area (1944-1945). He was Engineer of Far East Command general headquarters (1945-1949); commanded the 7th Engineer Brigade, U.S. Army Europe (1956-1958); and served his last assignment as Commanding General, U.S. Army Engineer Maintenance Center (1958-1959).
29. CAPT Francis E. Cothran (b. 1898) graduated from the USMA in 1922. After serving with the 11th Engineers in the Canal Zone (1923-1926), he was detailed briefly to the Air Corps (1926-1927) and later served in the St. Paul and Galveston Districts (1934-1936). His last assignment before retiring in 1939 was as Company Commander, 6th Engineers, at Fort Lawton, Washington.
30. Established in March 1933 as a New Deal work relief agency, the Civilian Conservation Corps (CCC) provided jobs (for males between the ages of 18 and 25) in reforestation, road construction, soil erosion prevention, and national park and flood control projects. Engineer officers served as project directors.
31. In 1930 the Corps of Engineers established a hydraulics laboratory--the Waterways Experiment Station--at Vicksburg, Mississippi. LT Herbert D. Vogel was the first director. Initially the station constructed a model of the Illinois River

in order to determine the backwater limits of the Mississippi River. The success of this project led to a second model, which, when completed in 1935, reproduced 600 miles of the lower Mississippi River. The practice of assigning young lieutenants to the Experiment Station for the period between graduate study and assignment to the Engineer School at Fort Belvoir began in the summer of 1931.

32. GEN William C. Westmoreland (b. 1914) became Superintendent of the USMA (1960-1963); Commander of the Military Assistance Command, Vietnam (1964-1968); and Chief of Staff, U.S. Army (1968-1972). GEN John L. Throckmorton (b. 1913) served as Deputy Commander under Westmoreland in Vietnam (1964-1965), Commanding General of Third Army (1967-1969), and Commanding General of Strike Command (1969-1973). LTG Frederick J. Clarke (b. 1915) served as Chief of Engineers (1969-1973). GEN Creighton W. Abrams, Jr. (1914-1974), succeeded Westmoreland as Commander of the Military Assistance Command, Vietnam (1968-1972), and as Chief of Staff, U.S. Army (1972-1974).
33. GEN Andrew J. Goodpaster (b. 1915) graduated from the USMA in 1939. He served as Supreme Allied Commander, Europe (1969-1974); retired in 1974; and returned to active duty as Superintendent of the USMA (1977-1981).
34. The text was Design of Concrete Structures by Leonard C. Urquhart and Charles E. O'Rourke, first published in 1923.
35. In June 1935 the Corps of Engineers began **constructing the Passamaquody Tidal Power Project** on Cobscook Bay near Eastport, Maine, with an initial allotment of \$10 million in federal emergency relief funds. From its inception the project suffered not only because of its dual work-relief/hydroelectric power nature but also because of the tremendous engineering and administrative problems and escalating costs. The next year Congress blocked further emergency relief funds for "Quoddy" and for the Cross-Florida Canal, another work-relief project undertaken by the Corps. When the Corps began demobilization at Quoddy in July 1936, only three small dams and limited excavation for the powerhouse were complete. The research on the region's special

engineering problems carried on by Wuerple and others was one positive achievement of the Corps' involvement at Quoddy.

36. Charles E. Wuerple (b. 1906) 'was a civilian engineer with the Corps of Engineers (1929-1948). His last assignment before leaving the Corps in 1948 to become technical director of the Marquette Cement Manufacturing Company in Chicago was as Chief of the Concrete Research Division, Corps of Engineers. He lectured widely on concrete technology, including at the USMA (1938-1941).
37. After its founding in 1881 as the School of Application for Infantry and Cavalry, the Command and General Staff School at Fort Leavenworth, Kansas, went through several reorganizations. Courses fluctuated from one to two years. in length depending on the demand for graduates. Between the wars, the school graduated nearly 4,500 officers from the Regular Army National Guard, and Reserves. The school's mission was to provide instruction that would prepare officers for duty in staff and command positions and, given lessons learned and recent developments, to ensure improvement in such areas as intelligence, tactics and logistics, and the employment of field forces. After World War II, the school became known as the Command and General Staff College.
38. GEN Thomas D. White (1901-1965) graduated from the USMA in 1920 and served as Chief of Staff, U.S. Air Force, from 1957 until his retirement in 1961.
39. BG James W. Green, Jr. (b. 1906) was Commandant of the Radar School (1942-1944) and served in the Southwest Pacific as Chief Signal Officer, Services of supply; and as Chief Signal Officer, U.S. Air Force, West Pacific (1944-1946). He was a professor of electricity at the USMA (1947-1957).
40. MG Paul F. Yount (b. 1908) graduated from the USMA in 1930. He served in CBI theater in World War II; and was Commanding General, 2d Logistics Command, Yokohama and Pusan (1950-1951); and Chief, Transportation Corps (1954-1958).
41. GEN Dwight D. Eisenhower (1890-1964) graduated from the USMA in 1915. He served in the Tank Corps (1918-1919). During World War II he was Commanding

General in the North African theater and Italy (1942-1943) and General of the Army, Supreme Allied Expeditionary Forces (1943-1945). After the war he served as Chief of Staff, U.S. Army (1945-1948), and as Supreme Allied Commander, Europe (1950-1952). He resigned from the Army in the summer of 1952 and served as President of the United States from 1953-1961.

42. GEN George S. Patton, Jr. (1885-1945), graduated from the USMA in 1909. He held three major commands during World War II: II Corps in North Africa (1942), Seventh Army in Sicily (1943), and Third Army in Europe (1944-1945).
43. The maneuver, which involved several river crossings, has been described as a "battle of engineers" and the "battle of bridges." Poor reconnaissance and a shortage of engineers hampered the exercise. Post-maneuver training attempted to correct these problems, but the need for engineers in combat became clear.
44. Engineer amphibious troops were training at Nantucket, Martha's Vineyard, and Washburn Island in New England and also at Camp Blanding, Florida. Several schools, including an advanced officer school and a welding and propeller school, were located on Cape Cod.
45. MG Jonathan W. Anderson (b. 1890) graduated from the U.S. Naval Academy in 1911. The following year he took a commission in the Field Artillery. He served in the War Plans Division before joining the 3d Infantry and becoming Commanding General, Amphibious Corps, Atlantic Fleet.
46. LTC Albert O. Connor (b. 1914) graduated from the USMA in 1937. He served in Italy as G-3 for the 3d Division (1943-1944) and for VI Corps (1944-1945). Among his later assignments were Secretary of Staff, Supreme Headquarters, Allied Powers Europe (1962-1964); Deputy Chief of Staff for Personnel, Department of the Army (1967-1969); and Commanding General, Third Army (1969-1972).
47. Located on the west coast of Morocco, Fedala was to be the location of the main amphibious attack in the Allied effort to liberate Casablanca as part of the TORCH operation.

48. Beginning in the spring of 1941, new inductees began to report to replacement training centers for individualized basic training before joining their units. Engineer troops attended a 12-week course. The first Engineer Replacement Training Center, located at Fort Belvoir, opened in March.
49. MG Harry J. Malony (1889-1971) graduated from the USMA in 1912. After serving as Commander of the 94th Infantry Division (1942-1945) and as commander of the International Forces in Greece for a year, General Malony finished his active duty career on the Special Staff, U.S. Army.
50. MG Keith R. Barney (1904-1977) graduated from the USMA in 1926. He later commanded the 1120th Engineer Combat Group in the ETO (1943-1945) and served as Deputy Chief of Engineers (1960-1962).
51. COL John B. Hughes (1896-1973) graduated from the USMA in November 1918 with a commission in the Corps of Engineers. He served as Engineer, Army Ground Forces (1942-1945) and as Director of Training, ETO (1945-1946). He retired in 1948.
52. GEN Albert C. Wedemeyer (b. 1896) graduated from the USMA in 1919 with a commission in the Infantry. He was Deputy Chief of Staff, Southeast Asia Command (1944); Commanding General, U.S. Forces, China (1945-1946); Director of the Plans and Operations Division, General Staff, U.S. Army (1947-1949); and Commanding General, Sixth Army (1949-1951).
53. At the Quadrant Conference in Quebec in August 1943, President Roosevelt, Prime Minister Churchill, and their chiefs of staff considered a plan for the combined defeat of Japan. Crucial to the success of such an operation was the recapture of Burma in order to reestablish a line of communications from Rangoon and to keep China in the war as an ally. Planners sought to defeat Japan by assault on the Central Pacific islands combined with developing bases in north China from which air assaults could be made easily on Japan. One result of the conference was the establishment of a new Southeast Asia Command with Vice Admiral Louis Mountbatten (1900-1980) as Supreme Commander, Southeast Asia. Lord Mountbatten was the son of Queen Victoria's granddaughter, had risen through

the ranks of the Royal Navy to become Chief of Combined Operations and a member of the British Chiefs of Staff Committee (1942-1943). He served as Supreme Allied Commander, Southeast Asia Command (1943-1946).

54. MG Desmond Harrison (b. 1896) was educated at the Royal Military Academy at Woolwich and at Cambridge University. He was Engineer in Chief, Southeast Asia Command, under Lord Mountbatten. After the war he served as Director of Fortifications and Works in the British War Office until his retirement in 1947.
55. LTG Raymond A. "Speck" Wheeler (1885-1974) graduated from the USMA in 1911. He participated in the Vera Cruz Expedition (1914) and was chief of the Persian Gulf Mission (1941-1942). In 1942 he was promoted to major general and served as Commanding General, CBI (1942-1944); and Deputy Supreme Commander, Southeast Asia Command (1944-1945). At the end of the war Wheeler became Chief of Engineers and held that position until his retirement in 1949. He was one of three officers who served in CBI and later became Chiefs of Engineers. The others were his successor, LTG Lewis A. Pick, and the subject of this interview, LTG Walter K. Wilson, Jr.
56. GEN Joseph W. Stilwell (1883-1946) graduated from the USMA in 1904 with a commission in the Infantry. In Europe during World War I he participated in several engagements, including St. Mihiel. After the war he studied Chinese, and in 1920 went to Peking as a language student, staying until 1923. Stilwell served with the American forces in China (1926-1929) and was military attaché at the U.S. embassy in Peiping (1935-1939). In March 1942 he became commander of U.S. Army Forces in CBI and commander of the Fifth and Sixth Chinese Armies. Later he was Chief of Staff to Chiang Kai-shek and Deputy Supreme Allied Commander, Southeast Asia Command. He returned to the U.S. in November 1944. His last assignment was as Commanding General, Sixth Army.
57. Prince Philip (b. 1921), whose mother was the sister of Lord Louis Mountbatten, married Princess Elizabeth, later Queen Elizabeth II.

- 580 Brig. James F. Benoy (b. 1896) attended St. John's College, Cambridge. He served in France and Belgium during World War I. He was Deputy Assistant Adjutant General, China Command (1936-1940); Deputy Adjutant and Quartermaster General, Southeast Asia Command (1944-1945); and headed Lord Mountbatten's liaison staff in Australia (1946).
59. COL Craig Smyser (b. 1911) graduated from the USMA in 1934 with a commission in the Field Artillery. He later transferred to the Corps of Engineers. He served as Executive Officer and Deputy Chief of Staff, Services of Supply, CBI (1945-1946); Executive Officer, OCE (1949-1952); and Engineer, Canal Zone, from 1952 until his retirement in 1954.
60. MG Thomas F. Farrell (b. 1891) graduated from Rensselaer Polytechnic Institute in 1912. In the fall of 1918 he served with the 1st Engineers of the American Expeditionary Force in France. General Farrell resigned- from the Regular Army in **January 1926** and entered the Engineer reserves the following month. He was in charge of construction and engineering for the New York State Department of Public Works (1930-1942). In February 1941, Farrell returned to active duty. He reported to CBI in November 1943 as Chief Engineer at Headquarters, Services of Supply, and as Commanding General of the Construction Service. After returning to the United States in early 1945, Farrell became Deputy Commanding General of the Manhattan Engineer District. He retired from active duty in April 1946.
61. LTG Daniel I. Sultan (1886-1947) graduated from the USMA in 1907 and joined the Corps of Engineers. Sultan served in Corregidor constructing fortifications (1916-1918) and worked on the Nicaragua Canal Survey (1929-1931). He was the Commanding General, U.S. Forces, CBI (1944-1945); and was Inspector General, U.S. Army (1945-1947).
62. MG Alvin C. Welling (b. 1910) graduated from the USMA in 1933. He received a master's degree in civil engineering from MIT in 1938 and served as Section Executive Officer on the Alcan Highway (1942-1943). Welling was Chief Engineer (1944-1945) and G-4 (1945-1946) at Headquarters, CBI. He was Baltimore District Engineer

(1948-1951); Executive Officer, OCE (1951-1955); Engineer Commissioner, District of Columbia (1957-1960); and Commanding General of the Corps of Engineers Ballistic Missile Construction Office (1960-1961). He retired in 1965.

63. BG Joseph A. Cranston (1898-1973) graduated from the USMA in 1919 with a commission in the Infantry. In CBI he was Commanding General, Intermediate Section Headquarters, in Chabua, Assam, India (1944); and with the Services of supply (1944-1945). When the Japanese invasion of western Burma and eastern India seemed likely in April 1944, Stilwell appointed Cranston as Ground Forces Commander, Upper Assam.
64. BG Robert R. Neyland, Jr. (1892-1962) graduated from the USMA in 1916 with a commission in the Corps of Engineers. He was aide-de-camp to General Douglas MacArthur at West Point (1921-1922) and professor of military science and tactics at the University of Tennessee (1925-1930) before retiring as a major in 1936. He returned to active duty in 1941; was promoted to brigadier general in 1944; and served as Commanding General, Base Section, Services of Supply, India-Burma theater (1944-1945). He retired in 1948.
65. Known as the "Boeing Superfortress," the B-29 was the most sophisticated of the World War II bombers. Each bomber was 99 feet long, had a 141-foot wingspan, and could carry 10 tons of bombs. The B-29 required an 8,500-foot runway, which was 2,500 feet longer than that needed by the next largest bomber, the B-17. First used in Bangkok in June 1944, B-29s flew approximately 35,000 sorties and dropped nearly 170,000 tons of bombs, including the atomic bomb, before the war's end.
66. BG Philip F. Kromer, Jr. (b. 1905) graduated from the USMA in 1930 with a commission in the Corps of Engineers. In CBI he was Division Engineer, Engineer Division #1, Calcutta (1943-1945); and Deputy Commanding Officer, Base Section, Calcutta (1945-1946). He served with the Armed Forces Special Weapons Project (1951-1953); was Chicago District Engineer (1953-1956); and Commanding General, Engineer Maintenance Center (1959-1962).

67. GEN Curtis E. LeMay (b. 1906) received a bachelor% degree in civil engineering from Ohio State University in 19270 During World War II he commanded bombing units in the European and Pacific theaters. He directed the 20th Bomber Command in B-29 attacks in CBI and on the Japanese mainland. Later he became Chief of Staff of the Strategic Air Forces in the Pacific. He commanded the Strategic Air Command (SAC), and was Vice Chief of Staff of the Air Force and the Chief of Staff of the Air Force between 1961 and his retirement in 1965.
68. GEN George C. Marshall (1880-1959) graduated from the Virginia Military Institute (VMI) in 1901 and was commissioned in the Infantry. He served with the American Expeditionary Force in France (1917-1919), as GEN John J. Pershing's aide-de-camp (1919-1924), and as Army Chief of Staff (1939-1945). General Eisenhower succeeded Marshall as Chief of Staff in November 1945, whereupon Marshall went on to become Secretary of State (1947-1949) and Secretary of Defense (1950-1951).
69. The last major German offensive, the Ardennes offensive (December 1944-January 1945), was known as the "Battle of the Bulge" because of the resulting triangular "bulge" of the line into Belgium. Although taken by surprise when the attack began on 16 December, the Allies countered with particularly strong efforts at St. Vith and Bastogne and by 21 January had restored the original line. Casualties were heavy on both sides.
70. MG Claude H. Chorpening (b. 1897) graduated from the USMA in November 1918 with a commission in the Corps of Engineers. He served as assistant to the Engineer of Fort Peck District (1937-1939) and as chief of the Development Branch and then Executive Officer of the Supply Division in OCE (1940-1943). He was Deputy Commander of the United Kingdom Base, Services of Supply (1943-1945), before shifting to the Pacific theater to become commanding officer of the Construction Service, Central Pacific Base Command. After the war he served as Tulsa District Engineer (1946-1949), and as chief of the Personnel Division and Assistant Chief of Engineers for Civil Works in OCE (1949-1954). He retired in 1956.
71. After breaking with the Communists in 1927, Chiang Kai-shek (1887-1975) reversed his policy of

appeasing the Japanese and allied with the Communists against Japan in 1936. Chiang became generalissimo in 1937 and Supreme Commander of the Allied Forces in the China theater in 1942. He obtained American support but had difficulty working with American commanders, notably Stilwell.

72. MG Royal B. Lord (1899-1963) graduated from the USMA in 1923 with a commission in the Corps of Engineers. He held various staff positions in ETO including Chief of Staff, Communications Zone; and Deputy Chief of Staff at Headquarters (1942-1946). He retired in 1946.
73. MG Marshall Stubbs (b. 1906) graduated from the USMA in 1929 with a commission in the Infantry. He served in Headquarters, Advance Section, Communications Zone; and as Chemical Officer and Deputy G-4 in ETO (1944-1945).
74. LTG Emerson C. Itschner (b. 1903) graduated from the USMA in 1923 with a commission in the Corps of Engineers. He was Chief Engineer, Advance Section, Communications Zone, ETO (1944-1945); I Corps Engineer in Korea (1950-1951); and North Pacific Division Engineer (1952-1953). In 1953 he came to Washington as assistant chief of engineers (1953-1956) and then served as Chief of Engineers until his retirement in 1961.
75. After the liberation of Antwerp in September 1944, this port city became a major target for German flying bombs, the V-1 and the V-2 Jet engines powered both rockets, but the more sophisticated V-2 carried a supply of liquid oxygen, allowing it to fly at higher altitudes. Once the failure of their last offensive became clear, the Germans hit Antwerp with a barrage of **V-1s**. General Wilson was there at the time of the heaviest attacks, which culminated on 16 February when 160 of the V-1s fell on the city.
76. LTG Marshall S. Carter (b. 1909) graduated from the USMA in 1931 with a commission in the Coast Artillery Corps. He served on the War Department General Staff (1942-1945). He was Deputy Director, Central Intelligence Agency (1962-1965), and Director, National Security Agency (1965-1969).

77. GEN Robert C. Richardson, Jr. (1882-1954), graduated from the USMA in 1904 with a commission in the Cavalry. He served as Commandant of Cadets (1929-1933) and as Commandant, the Cavalry School (1939-1940). He was Commanding General, Hawaiian Department; Military Governor of Hawaii; and Commanding General, Pacific Ocean Areas and Middle Pacific (1943-1946).
78. LTG Richard K. Sutherland (b. 1893) graduated from Yale University in 1916. During World War I he served with the Infantry on the Verdun front and at Chateau Thierry in the Aisne defensive (June-July 1918). He was MacArthur's Chief of Staff in the Southwest Pacific Area (March 1944-December 1945).
79. COL Vachel D. Whatley, Jr. (b. 1903), graduated from the USMA in 1927 with a commission in the Infantry. During World War II he served at Headquarters, U.S. Army Forces, Mid-Pacific. He retired in 1957.
80. LTG Samuel D. Sturgis, Jr. (1897-1964) graduated from the USMA in 1918 with a commission in the Corps of Engineers. General Sturgis served in France during World War I, and while in the Philippines (1926-1929) he commanded the 14th Engineer Regiment as the unit opened trails that were used by MacArthur in the defense of Bataan during World War II. He served on the Passamaquoddy Tidal Power Project (1935-1937) and as Vicksburg District Engineer (1939-1942). He joined the Sixth Army in the Southwest Pacific theater of operations as Chief Engineer in 1943 and remained with it throughout operations in New Guinea, the Philippines, and Japan. He was Deputy Director, Organization and Training Division, Headquarters, U.S. Army (1948-1949); and Missouri River Division Engineer (1949-1951). His last assignment before being selected as Chief of Engineers in 1953 was as Commanding General, Communications Zone, U.S. Army, Europe. He retired in 1956.
81. Gurkhas were soldiers from Nepal who served in the British and Indian Armies.
82. MG Thomas A. Terry (1885-1963) graduated from the USMA in 1908 with a commission in the Coast Artillery Corps. He was Commanding General, New

England Sector (1940-1942); 2d Service Command (1942-1945); and I-B theater (1945-1946). He retired in 1946.

83. MG William M. Creasy (b. 1905) graduated from the USMA in 1926 with a commission in the Air Service. He also served in the Field Artillery and the Chemical Warfare Service. He was Deputy Chief of Staff and Commanding Officer, Services of Supply, CBI (1944-1945). After the war he served in various capacities in the Chemical Corps, including as its chief (1954-1958).
84. The Corps of Engineers completed Baldhill Dam on the Sheyenne River in North Dakota in 1950. It provides substantial water supply and recreational benefits to the semi-arid region of the state. Baldhill resulted in the creation of Lake Ashtabula, which serves as a center for fish, wildlife, forest, and biological conservation as well as a popular recreational attraction.
85. In 1949 the Corps undertook a study for a permanent flood control project on the Souris River north of Minot, North Dakota. At the same time the Bureau of Reclamation was considering a Missouri-Souris diversion project. The bureau rejected the idea in 1956. After years of debate, Congress authorized the Burlington Dam in 1970. Preconstruction planning was still in progress in 1983.
86. Construction problems encountered in Alaska and Canada during World War II led to research on permafrost by the Missouri River Division beginning in 1943. Similar research began in Boston District the following year, resulting in the establishment of the Soils Foundation and Frost Effects Laboratory. In 1945 the Corps established the Permafrost Division in St. Paul District referred to here. See Walter K. Wilson, Jr., "The Problem of Permafrost," in appendix A.
87. In 1951 the Corps of Engineers began construction of an airbase at Thule, Greenland, as part of the support system for SAC bombers and the United States' advance warning system. Permafrost was a major problem. But, as Wilson indicates, the Corps used experience gained in World War II and relied on subsequent research to solve it. They erected buildings on pads containing materials that did not

transmit heat and used ducts to remove any heat that did escape into the flooring.

88. Concern over possible military operations relating to the Korean War was responsible for the founding of the Snow, Ice, and Permafrost Research Establishment (SIPRE) at Wilmette, IL, in 1951. This organization studied the physical and mechanical properties of snow and ice. In 1953 the Corps merged the St. Paul and Boston District units into the Arctic Construction Frost Effects Laboratory (ACFEL), which in 1963 combined with SIPRE to become the Cold Regions Research and Engineering Laboratory (CRREL), located in Hanover, NH.
- .89. COL William N. Leaf (1898-1948) graduated from the USMA in 1923 with a commission in the Corps of Engineers. He commanded the 592d Engineer Amphibious Regiment, Sixth Army, in the Southwest Pacific and Philippines (1943-1945), and served as Rock Island District Engineer from 1946 until his death on 1 June 1948.
90. The Corps of Engineers began construction of Allatoona Dam on the Etowah River upstream from Rome, Georgia, in 1944. Completed in 1955, the project provides a dam and reservoir for flood control, regulation of stream flow for navigation, and development of hydroelectric power.
91. The Jim Woodruff Reservoir resulted from Corps construction of a lock and dam as one of four projects for development of the Appalachicola River. The project began in 1947 and was completed ten years later. The **dam's** power-generating units have a capacity of 30,000 kilowatts.
92. BG Mason J. Young (1894-1982) graduated from the USMA in 1915 with a commission in the Corps of Engineers. He was Engineer, VII Corps, in the American and European theaters (1941-1945); South Atlantic Division Engineer (1947-1949); and Commander, European Command, Communications Zone, and Wurzburg German Military Post, 1951-1953.
93. MG Bernard L. Robinson (b. 1901) graduated from the USMA in 1920 with a commission in the Corps of Engineers. He commanded the 5201st Engineer Construction Brigade in the Southwest Pacific,

Philippines theater (1942-1945); and was Deputy Chief of Engineers for Construction (1953-1955) and Director, Joint Construction Agency, France (1955-1957).

94. The original Warrior-Tombigbee project, consisting of 17 dams with 18 lifts along the Black Warrior, Warrior, and Tombigbee Rivers, was completed in 1915. Demopolis Dam replaced locks 4 to 7.
95. The cost-plus-fixed-fee contract (CPFF) is used when insufficient time is available to prepare plans and specifications before construction starts; when details are scarce, as in this instance; or when the project is such that frequent changes are anticipated during construction. There is no competitive bidding. CPFF contracts involve close supervision of the work because reimbursement is limited to actual expenditures for work approved by the contracting officer. The fixed fee is based on a schedule of maximum fees calculated as a percentage of total cost.
96. MG Gerald E. Galloway (1902-1980) graduated from the USMA in 1925 with a commission in the Corps of Engineers. He commanded the 543d Engineer Boat and Shore Regiment in the Southwest Pacific theater (1942-1945), served in OCE (1949-1951), and was Commanding General of the Engineer Center and the Engineer School at Fort Belvoir (1958-1960). He completed his active duty career as Pacific Ocean Division Engineer (1960-1962).
97. Buford Dam-Lake Sidney Lanier is a multipurpose project with three power-generating units. The dam is located on the Chattahoochee River about 50 miles above Atlanta with a reservoir (Lake Sidney Lanier) extending 47 miles upriver. Construction began in March 1950 and was completed in June 1960.
98. Wernher von Braun (1912-1977) came to the United States with 120 associates in 1945 under contract to the U.S. Army Ordnance Department to develop rockets. Von Braun had been technical director of the German Army Rocket Center since 1937 and had developed the V-2. Von Braun's group became the nucleus of the U.S. Army Ordnance Guided Missile Division, Redstone Arsenal, at Huntsville, AL (1950-1955).

99. MG John R. Hardin (b. 1897) graduated from the USMA in 1919 with a commission in the corps of Engineers. As assistant to the District Engineer, he took charge of spillway construction at Fort Peck Dam (1934-1938). In 1939 he began a four-year tour in OCE serving as Chief, Rivers and Harbors Section (1939-1940); Chief, Construction Section (1940-1941); and Executive Officer, Construction Division (1941-1943). In ETO he was Deputy Chief Engineer (1943-1945). After the War he was Deputy Engineer, Lower Mississippi Valley Division, and Secretary of the Mississippi River Commission (1945-1947); New Orleans District Engineer (1947-1949); and Great Lakes Division Engineer (1949-1951). He returned to OCE in 1951 as Assistant Chief of Engineers for, Military Construction. His last assignment was as Division Engineer and President of the Mississippi River Commission (1953-1957).
100. The Corps of Engineers, acting as construction agent for the U.S. Air Force, began work on an airbase at Sidi Slimane, a town in the Rabat region of northwestern French Morocco, in 1951.
101. MG Curtis W. Chapman, Jr. (b. 1918) graduated from the USMA in 1941 with a commission in the Corps of Engineers. During World War II he commanded the 1312th Engineer General Service Regiment in Australia, New Guinea, and the Philippines. In the Mediterranean Division he was Chief, Operations Division (1952-1953), and Deputy Division Engineer (1953-1954) before he resigned from the Army. In 1959 he returned to active duty as Executive Director, Research and Development Division, OCE (1959-1960). He held troop command (1960-1968), was the Executive Officer in the OCE (1964-1966), and was Division Engineer, Pacific Ocean Division (1968-1970). He served as Deputy Commanding General, U.S. Army Combat Developments Command (1971-1973), and Senior Member, Weapons System Evaluation Group (1973-1975).
102. COL Gunnard W. "Swede" Carlson (1910-1983) graduated from the USMA in 1931. He served in the G-4 Section of Headquarters, Supreme Command, Allied Powers (1945-1946); was Boston District Engineer (1949-1950); served in Morocco with the Casablanca District (1952-1953); and was District Engineer at Nouasseur (1953-1954). He retired in 1958.

103. COL Paul D. Troxler (b. 1905) graduated from VMI in 1926. During World War II, after transferring from Field Artillery to the Corps of Engineers, he served in the Persian Gulf Command and in the Pacific. He was Deputy District Engineer, Athens, Greece (1947-1949); and organized and then commanded the Middle East District, headquartered in Tripoli, Libya (1950-1953). Following this assignment he served in OCE under the Assistant Chief of Engineers for Military Construction and then as District Engineer, Jacksonville (1957-1960). After retirement he was a project manager on the Link Canal Project in Pakistan (1960-1971).
104. After numerous delays, construction of an airfield began in February 1954 at Boulhaut, a town in French Morocco 28 miles east of Casablanca.
105. MG David H. Tulley (1904-1970) graduated from the USMA in 1925 with a commission in the Corps of Engineers. During World War II he was Assistant Army Engineer, Third Army, ETO (1944-1945). Later assignments were as Deputy Chief and Chief, Engineer Division, U.S. Army Europe (1952-1953); Assistant Chief of Engineers for Military Construction (1953-1956); and Commanding General, the Engineer Center and Fort Belvoir (1956-1958). He retired in 1961.
106. At this point Tulley left OCE to become Commanding General of the Engineer Center and Fort Belvoir.
107. Wilber M. Brucker served as Secretary of the Army for the period 21 July 1955 to 20 January 1961.
108. Robert S. Kerr (1896-1963) served as a U.S. senator from Oklahoma from 1949 until his death in 1963. General Wilson called on the senator because Kerr at the time was chairman of the Subcommittee on Rivers, Harbors, and Flood Control of the Senate Public Works Committee and was the ranking Democrat on the full committee. His subcommittee had control over Corps project authorizations. As chairman, Kerr was an ex officio member (with full voting and speaking rights) of the Senate Appropriations Subcommittee on Public Works, the committee which controlled appropriations for Corps projects.

109. MG William E. Potter (b. 1905) graduated from the USMA in 1928 with a commission in the Corps of Engineers. In World War II he served in the G-4 Section of Headquarters; and Headquarters, Communications Zone, ETO (1943-1945). He was Kansas City District Engineer (1945-1948), Alaska District Engineer (1948-1949), and Acting Assistant Chief of Engineers for Civil Works and Assistant Chief of Engineers for Special Projects (1949-1951). General Potter's last active duty assignments were as Missouri River Division Engineer (1952-1956) and as Governor of the Canal Zone and President of the Panama Canal Company (1956-1960).
110. MG Robert J. Fleming, Jr. (b. 1907) graduated from the USMA in 1928 with a commission in the Corps of Engineers. In World War II he served as Chief of Staff, Hawaii Service Command; Deputy Chief of Staff, Central Pacific Area (1942-1943); and Engineer, XXII Corps, ETO (1944-1945). General Fleming was Engineer, Office of the Chief, Army Field Forces (1951-1954); Southwest Division Engineer (1960-1962); and Governor of the Canal Zone and President of the Panama Canal Company (1962-1967).
111. LTG William F. Cassidy (b. 1908) graduated from the USMA in 1931 with a commission in the Corps of Engineers. In World War II he commanded the 815th Engineer Aviation Battalion in North Africa (1942-1943) and the 21st Engineer Aviation Regiment in Italy (1943-1944). He served in the Far East (1950-1953); as Division Engineer, South Pacific Division (1955-1958); in OCE as Assistant Chief of Engineers for Civil Works (1959-1962) and Deputy Chief of Engineers (1962-1963); and as Commanding General of the Engineer Center and Fort Belvoir (1963-1965) before his assignment as Chief of Engineers (1965-1969). He retired in 1969 but returned to active duty for one year as Chief of the Board of Engineers for Rivers and Harbors (1969-1970).
112. MG Thomas J. Hayes III (b. 1914) headed the Los Angeles Field Office, predecessor to CEBMCO (1958-1959), and then served as vice commander and commander of CEBMCO (1960-1962). He graduated from the USMA in 1936 with a commission in the Corps of Engineers. He directed military construction in

Greenland, Alaska, and the Caribbean (1941-1943) and served on the faculty of the Engineer school (1944-1945). Later assignments were as District Engineer, Little Rock (1952-1953) and Omaha (1953-1957); Assistant to the Chief of Engineers for NASA support and Director of Military Construction for Space Programs (1962-1964); Director of Topography and Military Engineering (1964-1967); and Division Engineer, South Atlantic (1967-1969). After retiring from the Army in 1969 he joined International Engineering Company.

113. From 1954 until 1959 the group was known as the Planning Studies Division and was part of the Army Map Service. In December 1959 the organization came under the command of Troop Operations, OCE, as the Strategic Planning Group. However, the group was still located in the same building as the Army Map Service. In 1977, after two further name changes, the group assumed its present designation, the Engineer Studies Center, and began reporting directly to the deputy chief of engineers.
114. BG William C. Hall (1909-1982) graduated from the USMA in 1931 with a commission in the Infantry but transferred to the Corps of Engineers in 1936. During World War II he was Assistant to the Chief, Intelligence Branch, OCE (1941-1943); and Commander, 1306th Engineer General Service Regiment (1943-1946), serving in the Southern Base Section, Communications Zone and the Third Army area, ETO (1943-1945); and in the Philippines (1945-1946). He was the Executive Officer in the Engineering Division, Military Construction, OCE (1946-1948); and Director of Personnel (1959-1961) and Director of Research and Development, OCE (1961-1962). He retired in 1963 and became Executive Secretary, Society of American Military Engineers (1965-1978).
115. Robert S. McNamara (b. 1916) was president of the Ford Motor Company when President John F. Kennedy appointed him Secretary of Defense in 1961. McNamara served in that position until 1968.
116. Adam Yarmolinsky (b. 1922) was Special Assistant to the Secretary of Defense (1961-1964). He is the author of The Military Establishment (1971).
117. GEN George H. Decker (1902-1980) graduated from Lafayette College in 1924. The same year he was

commissioned in the Infantry, Regular Army. During World War II he was Deputy Chief of Staff and Chief of Staff, Sixth Army, in the Southwest Pacific (1943-1946). He was Comptroller of the Army (1952-1955), and Vice Chief of Staff (1959-1960) and Chief of Staff, U.S. Army (1960-1962). As Chief of Staff he promoted the modernization of weapons and stronger ground forces in Europe.

118. GEN Earle G. Wheeler (1908-1975) succeeded Decker as Chief of Staff on 1 October 1962. General Wheeler graduated from the USMA in 1932 with a commission in the Infantry. In World War II he was Chief of Staff of the 63d Division in the American and European theaters (1943-1945). He served as Chief of Staff, U.S. Army (1962-1964), and as Chairman, Joint Chiefs of Staff, from 1964 until his retirement in 1970.
119. GEN Harold K. Johnson (b. 1912) graduated from the U.SMA in 1933 with a commission in the Infantry. During World War II he was a prisoner of war (1942-1945) following the fall of Bataan. He was Commandant of the Command and General Staff School (1960-1963); Deputy Chief of Staff, Military Operations, Department of the Army (1963-1964); and Chief of Staff, U.S. Army (1964-1968).
120. After graduation from Oregon State College with a B.S. in civil engineering in 1936, MG Jackson Graham (b. 1915) entered on active duty with the Corps of Engineers. During World War II he was a battalion commander and Division Engineer, 12th Armored Division (1942-1944), and commanded the 1160th Engineer Combat Group, ETO (1944-1945). He served as Assistant to the District Engineer and Executive Officer, Los Angeles Engineer District (1949-1951), and as Chief, Military Personnel Division, and then Assistant Chief of Engineers for Personnel and Administration (1951-1954). General Graham was District Engineer, Portland (1955-1958); Division Engineer, Ohio River Division (1961-1963); and Director of Civil Works, OCE (1963-1966).
121. On 23 March 1961 a chemical barge carrying several tanks of liquid chlorine sank in the Mississippi River 7.5 miles below Natchez. Private efforts to locate and raise the barge and its deadly cargo failed. Although estimates determined that the chlorine should not escape for decades, the

prediction that "uncontrolled release of the chlorine could cause 40,000 to 50,000 casualties with 10,000 to 20,000 fatalities" prompted the Office of Emergency Planning on 7 September 1962 to direct the Corps of Engineers to remove the hazard. COL Warren S. Everett, the Vicksburg District Engineer, took charge of the effort. Salvage operations were safely completed by the end of October. See Warren S. Everett, "Operation Chlorine," Military -Engineer 55 (March-April 1963): 79-83.

122. Along the lower Mississippi River, civilian levee boards, authorized by the state and organized locally, maintain Corps-built levees and construct levees in areas where the Corps does not have authority to do so.
123. The Beach Erosion Board existed from July 1930 until November 1963 when it was replaced by the Coastal Engineering Research Center (CERC). The board, comprised of civilian and military members, was responsible for beach erosion studies and research investigations. Congress created the Board of Engineers for Rivers and Harbors (BERH) in June 1902. The board, consisting of five Engineer officers, was charged with reviewing all reports on the examination and surveys authorized by Congress. The board later included Division Engineers in addition to the chairman and a resident member supported by a staff of civilians representing several disciplines.
124. Winton M. "Red" Blount (b. 1921) was president of the Blount Construction Company, Montgomery, Alabama (1946-1968), and Postmaster General of the United States (1969-1971).
125. MG Augustus M. Minton (b. 1911) was Director of Civil Engineering for the Air Force (1957-1963) and Chief of Staff of the Air Force (1964-1965). Commodore Archibald D. Hunter (b.1905) graduated from the U.S. Naval Academy in 1927. He served as Deputy Chief, U.S. Navy Bureau of Yards and Docks (1949-1953) and retired from active duty in 1959.
126. MG Daniel A. Raymond (b. 1917) graduated from the USMA in 1942 with a commission in the corps of Engineers. During World War II he served with the Fleet and Amphibious Force in the Mediterranean

(1942-1944) and with the 10th Engineer Battalion, 3d Infantry Division in ETO (1944-1945). He was Deputy Okinawa District Engineer (1958-1960); Mobile District Engineer (1961-1964); Deputy Director and Director of Construction, Construction Directorate, U.S. Military Assistance Command, Vietnam (1966-1967); Director, Southeast Asia Construction Group, Office of the Assistant Secretary of Defense (1967-1969); and Director of Military Construction, OCE (1969-1972).

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