

It was really a comedown for me to have participated in realistic Army training tests in Europe over many miles, exemplified by the example of the challenge of planning a bridge operation on the go, figuring out how you were going to fix the bridge before it went in, compared to taking Army training tests at Fort Leonard Wood, a very small installation where we couldn't roam very far and where we did not even have Army maps. We took that Army training test on Texaco maps because the regular ones weren't available. We were short so much and the standards of training were just so far lower than in Europe that it was a substantial change. It just made me think that we should never let a unit of the Army get into this kind of a situation if we can affect it.

Q: Now, you started out, I think, indicating that we should keep these things in mind with what we're doing with the force structure today. Right? The effect on morale when we're changing, we ought to keep that in mind with what we're doing now with reducing the military. I wonder if you could comment on that.

A: Yes, what I meant by that was, as we start making decisions on the build-down of the Army, we're planning to take out 35,000 annually. We've decided that's the ramp we could do considering the impact on the Army with all the personnel policies that will impinge on promotions, selections, and job satisfaction. We need to make sure we don't do something like, say, eliminating the company exec, because there's a building block that says after you've been a platoon leader so long, you should be given another development opportunity. I felt very little satisfaction, having been a platoon leader, having been a company exec, having been an assistant S-3, then going back and driving a platoon after three years of service. So, what I meant was, let's don't set up some scheme that fits the bean-counter notions but that really adversely impacts on a person's self-esteem, job satisfaction, and development. That's what I was referring to.

University of Illinois

Q: You indicated that all of your peers were getting ready to go back for civil schooling at that time, so you must have been doing some thinking during this period about where you'd like to go, what you'd like to do. How did you arrive at those decisions?

A: Well, in those days we received a form from Engineer Branch that said that I was selected for civil school, pick where I wanted to go. I submitted my desires by university choice and by discipline choice, and then the powers that be decided who was going where. Then I was told in December of '59 that I was going to go to the University of Illinois to study civil engineering with a physics minor for 20 months. So, that's the way it came back to me. I'd indicated Illinois as a choice and I'd indicated civil engineering. I don't recall if I'd indicated physics as a minor or some other program as a choice, but it was a one, two, three kind of choice indication.

Q: Most of your peers went to civil schooling during that period?

A: By most, I mean the number of engineer lieutenants that were going to stay on. I don't know what percentage it was. I think most of the Regular Army lieutenants who were going to stay on active duty that I had associated with went to civil school. The ones I knew seemed to. A lot of people got out after three years, four years too. You'd have to go back and look the numbers up to be accurate.

Q: I guess what I'm really getting at is that was more common then than it would become later on?

A: I don't know. They still sent a sizable number to school. There may have only been 35 or 40 then. I don't really know.

Q: Okay. For those people thinking about staying in, this was a step up their career ladder.

A: Yes, a significant and desired opportunity.

Q: How many fellow engineer officers were with you during the time at Illinois?

A: I don't know; we had quite a number. We had a number of Army officers there, to begin with. They weren't all engineers. For instance, General Lou Wagner, armor officer then a captain, later commander of AMC [Army Materiel Command], was there taking statics and that sort of thing because he was going back to teach in the department of mechanics at West Point. So, I think, as I recall, we had about 25 Army officers, of which the greater number were engineers. But that could be wrong too. There were quite a number.

Q: Was that a good experience for you? An interesting experience, going back to school, going back to graduate school?

A: Yes, I was ready to go back to school and it was a good experience. I very much did not want to go straight out of the Military Academy. Later on, they had a program whereby you could go direct, if you stood in the upper 5 percent of the class. I highly disagreed with that, thinking you should go out and be grounded in the field before going back to graduate school. I had done that and now it was time—I was in a good mental attitude to study and do academic work. I was married just a week before I reported there, so my wife, Ann, and I spent our first tour together at the University of Illinois. We had a lot of friends there that stayed friends for the rest of our careers.

Q: How did you meet your wife?

A: Well, back in the 23d Engineers, I was the date arranged for "Cousin Ann" when she came over to visit her cousin, Paula Campbell, and Lieutenant Jack Campbell who was a fellow lieutenant in the battalion. There were very few bachelors in the 23d Engineers, just three or four. Through this period, as I mentioned, there was not a great turnover, and so I'd become very friendly with the Campbells, and at all the battalion functions I would dance with Paula

Campbell. So, evidently she liked me enough and she fixed me up with Cousin Ann when she came over.

Q: Where's your wife from originally?

A: From Waukegan, Illinois.

Q: Illinois?

A: Paula Campbell was from Spring Valley and their mothers were sisters, spent a lot of time together during their youth.

Q: So, they had married student housing at the University of Illinois?

A: No. We bought our first house. We thought it was grossly expensive at, I think it was \$9,000. A car costs more than that now. In fact, we were so worried about the price that we got a guaranteed buy-back so we could sell it back to the builder-developer when we left two years later.

Q: Wouldn't be stuck with that heavy financial burden?

A: I wouldn't be stuck with that burden.

Q: Any other things about that almost—well, a little over a year and a half that you were at civil school?

A: No, it was a nice change from the rigors of troops, but it was also very rigorous. At that time we were accepted for full graduate work out of the Military Academy except for two courses taken the first summer, two undergraduate courses. One of those was in concrete and the other one, I believe, was in advanced calculus.

Other than that, we went straight into graduate work, and it was very rigorous and, in fact, I really wasn't prepared for it. The military officers there, the engineer officers, knew how to approach the task, but in fact our background at West Point at the time was not strong in civil engineering, and that's what I was taking. So, most of our civil colleagues were well ahead of us, some of them in industry architect/engineer firms, towns, communities, and were well ahead of us at the start. However, by the end of the period we Army engineers were making grades as good as or even beyond them, primarily because of our work habits and motivation and ability to go in and do the homework to catch up. At the start it was very difficult.

Q: You did a thesis?

A: No. They no longer required a thesis.

Q: Okay.

A: I should say one other thing, and that was I dropped out of the physics minor while I was there. That also was most difficult, and it was well beyond any preparation I had. The other

person who had signed up for the physics minor, then Lieutenant William “Herc” Carrol, also dropped the physics minor. He later got a Ph.D. in civil engineering and went back to be a deputy head of a department at West Point.

The two of us were sitting there one day at the start of a physics class when we looked around. It was a very small class but in a large teaching auditorium. I guess there must have been about 25 people there, and about half of them had Westinghouse notebooks and the other half had General Electric notebooks. Then there was Herc Carrol and me. The instructor came in and started writing formulas. He wrote them all the way around the room, all long physics formulas. Then he looked and pointed up at this thing hanging over our head on the wall, like at the Aerospace Museum here in Washington. It was the first betatron. He said, “Well, of course, I invented that.”

After he started writing formulas all around the room, both Herc and I felt that we were in a league that we weren’t prepared for, nor were we really interested in being in that league, being rather pragmatically oriented toward Army engineering that we had known in the field. So, we each at separate points, but within the month, marched down to see our faculty adviser, Dr. Nathan Newmark, and asked him if we couldn’t drop the physics minor.

So, I stayed on and got extra civil courses. Herc Carrol received approval to stay on and get his Ph.D.

Q: Do you think that physics minor might have come from the postwar engineer work in atomic weapons?

A: I think so. I think it had to do with nuclear effects.

Q: That’s what they were thinking about?

A: That was the reason they established that as a discipline.

Q: You didn’t sound earlier like you thought you had picked that as your minor.

A: I don’t remember picking it, no. The people going there for civil masters were going for a year. I was going for 20 months—that is, two summers, two fall semesters, and a single spring semester for the physics minor. Because I didn’t take that course until the first spring semester—I’d already finished the summer and the fall—and then dropped the physics minor, then we were able to ask to stay on. I really needed to stay on to finish the rest of the work because of what I’d been taking. So, I added other civil courses like hydrology, which was a help later when I got into the water resources business, and further geotech courses.

Illinois had some real heavyweights on their staff. Newmark was famous for dynamic structures and earthquake loading. He was my faculty adviser. Interestingly, at that time the Army told him, “Look, we’re sending you a lot of engineer officers every year to Illinois, more than any other university, but you’re not giving them any of your own personal class time. We’d like them to have some association with you.” I took the structure course that he invented in summer school, in the summer of ’61, and he taught it so he could catch up with

his credit with the Army. That was certainly a mixed blessing for me. First of all, there was the expedited nature of summer school, but second, we had an instructor who certainly knew his subject but was not interested in the basics. He was interested on the margins of where it worked and didn't work exactly according to his theory. So, we once again were jumped ahead beyond a basic foundation start into the midst of his interests.

[Richard S.] Englebrecht was there on the sanitary engineering side of the house, as were Ven Te Chow in hydrology; Dr. Ralph Peck, one of the greats in soil mechanics; and Don Deere in geology. One of the really interesting courses I took was with Peck and Deere, sharing case studies of things that worked and things that didn't work, where they had been called in as professors at Illinois to be consultants. Peck at this time was such a giant in his field that he only took jobs that interested him, that were a new challenge to him, something that intrigued him and piqued his interest. It was really interesting, interacting with those folks in those case studies.

Another new thing that happened that time—we had this huge box in a room that we went in to see one day, and it was called a computer. I mean, it was room-sized. Illinois had one of the first, supposedly, of these computers. So, I took a computer course with Steve Fenves, who later was big in that business at the University of Pittsburgh, in the department of engineering applications in automation. Ours was basically a programming course at that time, and we learned to program and operate the computers and run engineering solutions. Fenves was an assistant professor of engineering.

I ran into another assistant professor when I got into the construction management arena. First of all, I took an operations research/systems analysis course, a decision-making kind of approach. Then I took an elective with another professor by the name of Dick Schafer, who, of course, later was instrumental as the University of Illinois tied together its proposal to the Corps that became the Construction Engineering Research Laboratory. He then became the tech director of the laboratory. So, Dick Schafer and I can get together all the time and tell war stories about my captain days and his assistant professor days at Illinois.

Q: When were you promoted to captain?

A: It was in July of '61, while I was at the University of Illinois.

Q: To go back, I don't know exactly how to phrase this question, and I don't want to phrase it negatively, but you were talking about your West Point preparation. I can't think of any way to phrase it but negatively. Would you fault West Point for not having prepared you better in engineering, or that's not really the purpose of West Point?

A: No, it wasn't the purpose of West Point, and that was why—I guess it was recognition by the Army or the university that they were putting me into a course of study for which I really didn't have all the concrete, all the structures, all the soils that they thought I had. In other words, I was being credited with a full undergraduate civil engineering background, and I certainly didn't have that.

So, they recognized that in terms of the concrete, and I had to take an undergraduate concrete design course before I could move ahead. It was not recognized in other subjects. Certainly, I was heavily into soils, and when I hit Dr. Roy Olson's soils class and we were into clays and all the properties of clays and the basics, I had had little—a few days of soils at the Military Academy, a little bit at the Engineer School—but certainly was not prepared for the kind of things he had us into immediately.

I remember his derisive remarks that he had all these military folks who didn't know what they were talking about coming into his class, and he also had one of his students who had worked 12 years in subways in Canada or somewhere who really knew clays. On the first exam, all of us in the military went deficient—got "F"s. This guy was a shining light with his "A."

By the end of the semester most of us in the military had passed that guy in overall grades. We did not start up where the rest of them started. So, I don't fault the Military Academy on that because that wasn't the reason for the Military Academy. We all knew what we took when we were there. Now, the Military Academy has changed. They now have majors. You can now major in civil engineering, and I would suppose that today's graduate is better prepared in the kind of terms that I described than I was then.

Q: I suppose a part of it is the West Point legacy as beginning and being so heavily engineering for so long, and that reputation persists even after the curriculum may have changed.

A: Yes, I'm not sure the curriculum ever changed. I think what happened was that West Point was established as the first engineering school in the United States and then most of the other early engineer schools spun off of West Point and a lot of the instructors at them were West Point graduates. Then we settled the West, and Army engineers did all those things. Engineering at that point was rudimentary compared to what it was years later, certainly by the time I went to University of Illinois. So, engineers back then were across the board in disciplines.

Now we have one discipline oriented toward sanitary, another one toward structures, another one toward highways, another one toward soils. I mean, the subdivisions were all there and you really couldn't, nor did I at Illinois, concentrate in particular subdivisions. So, I think the whole development of civil engineering and engineering across the board has developed so extensively that it just encompassed a bigger environment.

Q: So, you finished your degree work, I think you mentioned the other day, in February 1962?

A: February '62.