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NO. 53

INTERVIEW WITH THOMAS V. BOCKMAN

CONDUCTED BY THOMAS A. SCOTT

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Cobb County Oral History Series, No. 53
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Location: Bentley Rare Book Gallery, Kennesaw State University

During World War II, Mr. Bockman was an engineer at the Bell Aircraft plant in Marietta, Georgia.

TS: Let's begin, Mr. Bockman, with a little biographical background on you. Could you say a little about when you were born and where you were born?

TB: Yes. I was born in Augusta, Georgia, on September 2, 1920. I went to school, of course, in the local schools in Augusta. I went to high school and then to the Augusta Junior College, which was a private junior college at that time. It's since become part of the university system.

TS: Right.

TS: I finished in '37 high school and '39 in junior college. Jobs were pretty hard to find at that time. My mother insisted on going to a little bit higher education. So the only way I could get a college education was to go through the co-op program at Georgia Tech. It was sort of strange, because at that time, I called them up about the 1st of September; and they just said, "Come on up and enroll." There were no tests or anything else. Just an afterthought or just something that was sort of peculiar, nowadays -- the tuition was fifty dollars a quarter at that time.

TS: But in 1939 fifty dollars was quite a bit.

TB: That's right. I went to the co-op program for two years, worked for the Georgia Power Company in several different fields. Then, when the war broke out in December of '41, it was time to accelerate the education program. So I got out of the co-op program and went through the Georgia Tech regular program, which was a full-time program at that time. I finished in February of '43, which was the first graduating class under this accelerated program. We had 232 or 236, I can't remember the exact number, graduates at that time. If you had gone to a junior college before you went to Tech, you didn't have to take ROTC of any sort. Now, if you had enrolled as a freshman, you had to take ROTC or naval ROTC, either one. So I had no Army or Navy commitment when I finished. Most of the people who came to interview you

on the campus were connected either with war work or the armed forces. At that time I was seeing somebody here in Atlanta, [and] I thought I was going to stay around for a while. So I decided to go to work for Bell.

TS: You mean a girlfriend.

TB: A girlfriend, yes. Bell was not the only [employer] that offered me a job. I had a commission offered in the Marines and in the Army also. But I just elected to stay with Bell. I went to work for them sometime in February of '43 after about a week's vacation or something like that. The engineering department headquarters was down on the corner of Marietta and Jones Avenue, which was downtown. They had a loft there where they had a lot of drafting tables and everything else. I was hired as a draftsman. All of the engineers who finished Tech went to work for Bell as draftsmen. The aircraft business with Bell was divided into groups. The engineering department was also. They had an electrical group, a radio group, a wing group and several groups like that. The group leaders had all come down from Buffalo. They were experienced people in the aircraft business. Now, not in the big airplane business, because they had only built small airplanes before. So it was sort of a new experience for all of us.

TS: Were these engineers?

TB: They were engineers. Some of them had worked their way up to become engineers.

TS: In other words they didn't have a college degree?

TB: Not all of them. But they were knowledgeable about the aircraft business. Of course, these Georgia Tech graduates, of whom I was one, knew nothing about the aircraft business. So we had to learn it from the bottom up, you might say. That's the reason why we all went to work as draftsmen. I guess at a pretty low salary--at that time they were hiring electrical engineers at eighty cents an hour, mechanicals at ninety cents an hour, and aeronautical engineers at one dollar an hour. We were working fifty-four hours a week. So even though the salaries were fairly low, the amount of money that you got was significant. I thought I'd never been so lucky, you might say.

TS: Making about forty dollars a week?

TB: Yes. It amounted to about $220.00 a month, something like that. It didn't cost that much to live. We lived in boarding houses and shared a room. My roommate and I had been roommates in college, and so we didn't have a lot of expenses. We had a car in which we took other people back and forth to Bell Aircraft. We had what you call a C-ration sticker, which allowed you enough gas to get back and forth to work and maybe a little pleasure driving, but not much. We stayed down on Marietta Street for about two weeks. At the end of that first two weeks we all went out to Marietta. The engineering department was housed in one of two buildings which were on the south side of the main building. The parking lot was just a sea of mud, and I can remember some of the old hands would wear old shoes and carry their good shoes in their hands and change shoes when they got inside. Later on they paved the parking lot, but then they made us all come through the main building underneath in through tunnels where they had the guards on all the entrances. Of course, none of the buildings were air conditioned. The temporary buildings where we were had lots of windows that you could open and lots of dust, as you can imagine, in the summer. They had big fans that would sort of cool the place off.

TS: You say you were south of the main building?

TB: Yes.

TS: I have some picturers that shows the B-2 building, which was Administration.

TB: There was another building in between that and the big building.

TS: And that's where you were?

TB: Yes. We were separated only by a sort of a driveway from the main building. Where we worked, we had access to the main building, because they had a group out in the main building called liaison engineering. If they had trouble in the main building, something didn't work or something didn't fit, they were supposed to go to the liaison engineering who then came to us. The way that Bell Aircraft worked -- the Boeing aircraft out in Seattle was the prime contractor -- Bell was the subcontractor. All the drawings for the B-29 were sent from Boeing.

TS: Right.

TB: We, of course, were familiar with the drawings. If something didn't fit

according to the drawings, we were authorized to make what they call an engineering deviation to make it fit. When it first started, the main purpose of the engineering department was to get things going and take care of any minor discrepancies that arose between the people in Seattle and the people in Marietta who were actually building their planes. They were building B-29s in Seattle at a place called Renton, at Wichita, and at Marietta. These were the three places where they were building [B-29s]. Renton is just a suburb of Seattle. These deviations that we would make, they would arise from things that didn't work. Down in the basement where we were was a group called the loft engineering. Now this is a ship building term, because they laid out things exactly like you would do when you were building a ship. They used tremendous pieces of metal.

TS: Right.

TB: They would make what they call the templates, which they would then send out to the shop. The shop would then use these as patterns to make a lot of parts from these templates. Bell Aircraft was primarily an assembly plant. We got in, for example, engines from Pratt & Whitney to start with. We got parts of the wing from one place. The tail came from another place. So the primary purpose of Bell was to work on one or two sections of the airplane. They made one or two sections, but most of it was an assembly group. I think they actually called it the Bell Assembly Plant.

TS: I wanted to ask you about the engines. You said Pratt & Whitney. Some of the other interviews I've done mentioned Allison [on the planes built in Buffalo].

TB: I don't know of any Allison engines. Now they had some Wright engines. They were not powerful enough. So the later models of the B-29s used these Pratt & Whitney. They were two thousand hp engines. The propellers came from Hamilton Standard, who made propellers. A lot of these places were providing parts that had never built parts before for airplanes. They had been converted to war work. For example, that River Rouge plant of Ford. They were making B-24s up there, and they had never done airplane work before. There were a lot of different companies who were making things that they had never made before. So you had some problems.

TS: Well, the whole aircraft industry is really pretty much a product of World War II, isn't it?

TB: Yes, it is. The big ones came out of World War II and have since consolidated a lot, but there were a lot of them at that time. A lot of small ones.

TS: There was another thing I wanted to ask you about. You got your degree in electrical engineering?

TB: Electrical. That's right.

TS: I know that Georgia Tech actually had an aeronautical school that a man by the name of Montgomery Knight headed up. You don't remember much about that? It's called the Guggenheim School of Aeronautics.

TB: See, I never took a course at it. Electricals took courses in several other places like civil engineering, mechanical engineering, but we never got into the aeronautical field. Now the aeronautical people had to take some courses in other sciences, but we never got into the aeronautical. Georgia Tech was primarily an electrical, mechanical, textile, and civil engineering school at that time. The aeronautical department was very small. You can still see that building. It's on the corner of North Avenue and Hemphill. The original building was very small.

TS: The building is still there?

TB: Yes, the building is still there. We had four people, that I know of, from the aeronautical department that came to work for Bell.

TS: I guess there really wouldn't be that much of a demand before World War II for aeronautical engineers.

TB: No, they had an experimental station at Wright Field in Dayton. They were hiring some, but it was a fairly new field. There was not much commercial aircraft even at that time.

TS: Yes. Well, you must have been one of the youngest engineers at Bell.

TB: Well, I was actually about a year older than the average graduate. I was twenty-two when I went to work for [Bell]. I had stayed out of school a year while I was a co-op. I ran out of money and worked full time for about a year. So I was about a year behind. But in Augusta we had a 7/4 program [seven years of elementary and four years of high school]. In the early 1920s, they cut out the eighth grade in grammar school and used the money to start this

junior college. So I was sixteen when I got out of high school and eighteen after two years of college. I should have finished when I was about twenty or twenty-one, and, actually, I was about twenty-two when I finished. But people who had gone through the co-op program, which was a five-year program at that time, were generally a year older than the average graduate, because it took five years instead of four.

TS: So those of you in the engineering department at Bell were a bunch of young guys who were just all right straight out of school?

TB: That's right, but I did want to say that in addition to the young people, we had a lot of older people. We had people whose businesses had gone kaput, because they could not get the parts that they needed. I had a fifty-year-old man working in the same group that I did who had been in the heating and air condition business. There were several people like that whose businesses could no longer operate, because they couldn't get the materials. All the materials were going to the armed forces. So we actually had a mixture of very young people or middle-aged people, mostly. We had a lot of women. We had several women draftsmen who were in the same situation that we were, who had been hired as draftsmen, who had gone maybe two years to a college and had taken the drawing that was necessary. We had a lot of girls working in the filing sections in what they called cardex at that time, which kept track of all the parts that were being used everywhere. I can remember one of the supervisory people that came down from Buffalo was a lady. She was in charge of these groups of ladies who were doing this cardex business. I think it was the first time really that there were a large number of ladies being hired for sort of semi-technical work. A lot of them liked it, but a lot of them had husbands who were in the armed forces. In '43, they were really trying to build up the armed forces, so they were taking lots of people. I know the draft board were always after us. We were classified 2-A, I think, which was deferred because of war activities. But every now and then, they would call you up. You would have to go down there and talk to them and tell them what you were doing. Then they gave you another deferral for another year.

TS: Right.

TB: But it was funny. As soon as the war in Japan was over, they shut this B-29 program down in Marietta. Now they may have continued at some of the other places. I can't even remember what they did for us, but I am sure they gave us a couple of weeks severance pay and turned us loose. But that draft board was after us. Within two weeks we had to go down and talk to them. The

next thing you knew I was in the Armed Forces and gone from there even though I had one child at that time and another one on the way. But that was just the way it was.

TS: When the plant closed down was this about August?

TB: Yes. It was late August. I think we stayed on there to clean up everything until about the middle of September. I think at least the engineering department did. I am sure that they had a contract to finish a certain number of airplanes, but it could be reduced. These contracts with the Air Force, the Air Force always had the prerogative to cut them off, and I think that's what they did. Now that was up in the high echelons of the work. I don't know exactly how they did that, but I am sure they just curtailed the program right then. They turned a lot of people loose.

TS: It's very, very sudden.

TB: Yes. You could see the handwriting on the wall though, because when the war was over in Europe, these B-29s were actually supposed to go to the Pacific with a few going over to Europe. Of course, the one's that were over in Europe, they were able to bring them back. So they really didn't need as many as they thought they would.

TS: I wasn't aware that any went to Europe.

TB: Yes. They had a few over there.

TS: Did they have much use in Europe?

TB: No. They were really just used for training, with the idea that later on, if they needed them, they would send them over there [to Asia]. But the B-17s that they were using over there for daylight bombing--of course, the English used their own for night time bombing, and they were adequate for what they were trying to do. They were still turning out those B-17s, and Boeing was also building those, you see.

TS: Well, now you became Chief Electrical Engineer at Bell?

TB: Yes. People kept getting promoted out there. For example, my boss, was a fellow named John Carpenter. He was the electrical group leader. The Chief Electrical Design Group Leader was his title. The chief engineer moved to a

higher job, the assistant got his job, and then my group leader became the assistant chief engineer out there. So that left a vacancy in the department. Another fellow who worked there got the job first, and then he got sick and had to leave. So I got the job, because of failure of anybody else to qualify, you might say. The title was actually Chief Electrical Design Engineer, and I got the job because of attrition. I believe I had the job for about a year.

TS: How many people worked for you?

TB: I had nine counting everybody. That was about the size of all of the groups out there, because, remember, we didn't do a lot of design work itself. It was more a question of correcting errors, making sure everything worked right out in the shop. We were in the shop a good bit, because sometimes you had to go out and see this group called the liaison engineers. [They] would come and bring problems to you. Then you would have to go out and look at them. They had a system out at Bell that you could go certain places with the colors on your badges. If you had a black circle with your picture on it--black all around--you could go any place. Some people had red; they could only go to certain areas. Some people had no colors on their badges, and they couldn't go out of the building where they were in, because they had guards leaving the building and also entering the building. Most of the people in the engineering department could go out into the main assembly plant with no problems.

TS: What color badge did you have?

TB: I had a black one.

TS: So, you could go anywhere?

TB: At the end, yes. I started out with a red one, and then a half black one, and then a complete black one.

TS: Better not be color blind.

TB: No, that's right. That was a big place, and they had motor scooters out there in a pool that you could go and get a motor scooter and go from one end of the building to the other. It saved a lot of walking, because I think that building was pretty close to a half of a mile long.

TS: I have got some photographs of dignitaries being taken around the plant in this little golf cart type thing that holds four or five people.

TB: Well, ours was just a single back then. It was kind of like a moped, because you really weren't carrying anybody. You were just going from one place to the other to see something. But I was always surprised at the number of women. They had women doing a lot of the assembly work. Riveting. This airplane was not welded. It was all riveted together. They were also making up electrical harnesses with a connector at each end, so that they could be plugged into equipment that would be brought in later on. Of course, some of them had one hundred or two hundred wires in these harnesses all stamped with a number. The women did most of this.

TS: I've got a picture of women working on the harnesses. I wish I had brought it with me. It looks almost like they were sewing on something.

TB: These long harnesses--they were putting the wires in and soldering the wires to the connectors. As I said, it was the first time that so many of them had really done anything of a technical nature, and they did a real good job. We had very few troubles with the harnesses. The electrical work.

TS: I guess I don't think of drafting as an electrical engineer-type job.

TB: Well, it's not. You couldn't get an engineer today to go to work as a draftsman. That was the job that was open. They may have had some engineers that I don't know about. But, all the graduates that came out of Tech at that time, even the aeronauticals, were all hired as draftsmen.

TS: So it's really below your degree type of entry level job?

TB: Yes, but I think they were hiring all the engineers that they could get, because --and, I am afraid to say it--but they were stock piling them you might say. A lot of times there was very little for us to do out there, because everything was going smoothly, so we didn't have any problems. A lot of the engineers left finally before the program was over. I know of three that went into the Navy. Two aeronauticals and my roommate went into the Navy. He and I both went down and took the Naval exam and passed it for commission in the Navy. I passed it except for a physical defect. I had what they call a deviated septum, which is a bone that had been broken--my nose had been broken, and it had been pushed over to one side. So I had to have an operation to get into the Navy. I had the operation, and everything was all right. But then I decided at the last minute I didn't want to go. This was in '44, after I had been at Bell a couple of years. A lot of people were leaving, so they kept hiring engineers all the time. But they would pay them a lot more money. The last groups that

were hired, they always paid more for the new people. This caused a lot of friction out there.

TS: I imagine so.

TB: Because it was hard to get a raise during the war. Actually, some group in Washington had to approve raises. You had to go through the Air Force also. They had their own inspectors and their own personnel out at Marietta. Bell Aircraft had their own inspection department, but the government had their own inspection department, too. Lots of wrangling between the two of them. The government inspectors were, for the most part, all civilians, just like at Bell Aircraft. Now, the heads of the inspection department were military people. They had some colonels and some majors. The [military] didn't have enough personnel to look at all of that. So they depended a lot on the civilian inspectors.

TS: As I understand it, Bell would inspect the plane off of the assembly line. Then, after some bugs had been worked out, the Army would inspect it again?

TB: And would accept it or would reject it. But there was inspection at every level. I mean, they would inspect rivets.

TS: Oh, okay.

TB: Both groups would, you see.

TS: How many planes got rejected? Was it frequent?

TB: None of the planes ever got rejected. The way this inspection was done, the faults were corrected before the planes got out on final test or final assembly.

TS: So they're saying, "We're not going to take this till you do blah, blah, blah?"

TB: That's right. Now, when we would make a correction, for example, a lot of the corrections really were not of a physical nature in that they affected the performance of the airplane. It was just something that didn't fit exactly right, but they had managed to take care of it out in the field. They put a date or a serial number on the airplane that this deviation would apply to, because a lot of times they had to change the templates, you see, that they were making these parts from. So you couldn't just stop everything and go out there and make a correction. If the correction needed to be done from a safety

standpoint, it was done right away. If it was some cosmetic type thing it had a serial number on which it was affected on the airplane.

TS: Well, let me see if I understand correctly the difference between an assembly plant and say what they've got at Lockheed. If you had been at Seattle as an engineer they must have had at least twenty times more engineers than you had?

TB: I expect they had a big crowd out there. We had in the engineering department in total (if you count all the support personnel, like the cardex people and that sort of thing) probably two hundred people. I expect they had a couple of thousand. Maybe three or four thousand out there [in Washington].

TS: Right.

TB: Because actually they had to design the airplane. All we were doing was taking what they had designed and putting it together. But the design of the B-29 was probably done about 1937. There is usually about a four year lag between the design and the time the plane comes off the assembly line. It takes a long time to do that because you start off with a basic plane. Say the Air Force or Army at that time wanted a four-engine bomber that was capable of doing this--it could carry so many tons of bombs and so forth. They would put that out as a proposal. The different aircraft companies would submit proposals. Then the Army would look at that and would decide which they wanted to take. They would build a prototype and see if it met all the criteria. Then they would modify that. All of this was taking time before they ever got the assembly lines going. So, probably, I would say four years was a pretty good time between concept and final approval.

TS: So this is a plane that had not yet been test flown when Bell got its contract, but had been designed?

TB: It had been designed.. They had something called an XB-29. I am sure it had been put together when Bell got the contract. But whether it had been flown or not I don't know. But it was not at Marietta. It was at Seattle.

TS: When it gets to your department, what kinds of things would you be changing at that point? Would somebody come in and say the door was too small to get out of or would they say that the plane doesn't go fast enough?

TB: Those would be design functions that we really had no control over. My

roommate went out to Seattle, and he acted as a liaison to Bell and Boeing. We had so much problems going back and forth saying that this doesn't work right down here. We sent him out there, because he knew first hand the problems that we were having here. So he was actually the liaison out there between Bell and Boeing. Generally speaking, you didn't have a problem like that. The doors would always fit. The holes may not have lined up just right, because sometimes the people who made the doors--and again this is an assembly--they wouldn't drill the holes just right. So, we would correct that out in the field. They would bring the problem to us, and we would say, "Okay, if they are going to continue to make these doors this way, we have got to change the way the door frames are drilled to receive the doors". So we would take care of a problem like that.

TS: So, you say move 1 mm?

TB: That's right. That sort of thing. That's all we did. Now, we were doing no design work at all. We corrected mistakes, taking care of little flaws where they had numbered the wires wrong. The connectors were not quite the right size. They didn't fit. The boxes came from some other place. That sort of thing. That was what we were doing for the most part.

TS: Did you have any supervisory function over these ladies that are making those electrical harnesses?

TB: No, I didn't. We would go up there and kind of throw our weight around a little bit to their own supervisors. But for the most part they did a bang up job.

TS: You mean, throw your weight around like move something 10 mm?

TB: That sort of thing or "Look, why can't you do so and so?" or "Speed this thing up a little bit." "Take care of this problem that has come up." And "these wires are falling out and have not been soldered correctly." That sort of thing, and that's what you would talk to them about.

TS: You said they did a bang up job. You think the quality of work was pretty good by what was not really a particularly well-educated work force to begin with?

TB: They had done a real good job in educating these people. Remember now this was an assembly line type thing. In the automobile business one guy tightens a nut, and that's all he does all day. These people were doing somewhat the

same thing, but they had to be very careful about making sure that the electrical harnesses, for example, had the right number of wires, that the wires went to the right little pin on the connectors, and that sort of thing. They had evidently given them a lot of training on how to do this sort of thing, and I don't know where they gave them that training, because we were downtown. When we moved out there to Marietta, they had already started working, making things. So they must have had a training school maybe in the big plant where they trained all these people on how to do things.

TS: Because somebody's job might have been to count the wires or get the wires into the right hole?

TB: Right. They would have a bundle of wires, and they would count those and make sure that the numbers were on all the wires and the sizes were right. They would have a number on the wire [such as] 122; [and] it went to a ceratin connector and a different pin to this connector. They would make sure that right number of wires. They were all printed to tell which is which.

TS: Different colors?

TB: Some of them had different colors, but they had so many of them you couldn't have colors. When you put more than three color on a wire you were in trouble. A lot of people may have been color blind. So you would always have that sort of problem. Now it was a great day though when they rolled that first one out. They stopped work that day. They got us all at the end of that big building. The big assembly. The first one came rolling down the line. It was a on a dolly tractor pulling it. But everyone cheered and hollered and everything else.

TS: About this time of the year in 1943, I believe.

TB: I can't remember exactly when it was, because we just went right back to work. They shut things down for about thirty minutes and went right back to work.

TS: I don't quite understand an airplane assembly line, I guess, because I think in the automobile assembly line there's a conveyor belt, and its constantly moving. It doesn't look like it worked that way.

TB: No, it didn't move. Now they would have hoists. When they finished a section -- now remember, this thing was built in five sections not counting the

wings. Each section was completed in one location like the forward section, where the pilots sat and the radio operators and all that. They were up in this front section--bombardiers. When that section was completed, they would pick it up with a crane and take it over to where the section that it was to be joined to was located, which is the middle section where the wings were. The wings were not put on at that time, because they took up too much room. So the wing stubs were sticking out. Then, when these two sections were finished, they take that same one up and move it where the back section or the tail section was. That is the way it was done. It wasn't on a moving belt of any sort.

TS: Did you say basically five sections?

TB: Let's see. The forward section, the wing section, the bomb bay section, the rear section and the tail section. There were five sections. The bomb bay section was not pressurized. In other words, it was open to the atmosphere where the bombs were.

TS: Because you had to open the door?

TB: Yes. There was a tunnel between the first section where the people who drove the airplane and the radio operators and bombardiers were and the navigator back to the pressurized section where the middle gunners were. That's where the toilets were and that sort of thing. Remember this aircraft was made for long distance flying.

TS: Right.

TB: So they had an auxiliary generator back there that could take care of the radio in case you had an electrical failure. They had the toilets. They had places where the people could move around. The tunnel connected the forward section with this section. Then there was a place where the tail gunner sat that was also pressurized, but it went through an unpressurized section. There was no tunnel back there. He had to open doors to get back where he was. But there was a tunnel, I want to say about thirty inches in diameter, that you crawled through that was the only access from front to the rear. You could go through the bomb bay, but it was open. At the altitudes that they were flying, you couldn't live if you went through there, because there was no air. These airplanes were flying about thirty thousand to thirty-five thousand feet. We made some airplanes that had different modifications on them out there. We made some with no turrets on them that we used as photographic airplanes.

Had no armament at all on them, but they would fly so high and could fly faster than any of the Japanese airplanes. Even the pursuit airplanes or the fighter airplanes could not fly as high or as fast. These airplanes, I think, they redlined it on the speed indicator. They had a redline which you were not supposed to exceed. I think these airplanes redlined around 380 or something like that with all the equipment, but when you took the equipment off of them they could go over 400 miles per hour. None of the propellor driven airplanes in World War II could fly as fast as that. At least in the Japanese theater they couldn't.

TS: So if the jets came in...

TB: They had some jets in the European theater, but the Japanese never had any jets.

TS: Well, let's talk a little bit about the impact that Bell Aircraft had. In your case with an engineering degree, you probably could have gone to work anywhere and done well, but a lot of people really got their training at Bell, didn't they? You certainly got some experience.

TB: Yes. People down here found out they could do these technical jobs as well as people from up North. This, I think, inspired a lot of companies who saw what had happened during the war with a lot of trained people who were trained to do different jobs. That's when they started coming down here. Started moving South with a lot of technical industries. Up until World War II, the technical industries in the South were mostly in the cotton mill-type fields. The South was primarily agricultural until World War II came along. A lot of the people who had worked in the fields--farming work--went to get these better jobs. A lot of them went up north, and a lot of them got jobs at places like Bell Aircraft and other people who were doing war work. These companies found out that these people could do just as well as some of the people from up north who they thought were better educated. I think they were better educated, but the farmers have a natural knack for making things work, because they had to. They would be out there on their own, and if something broke down they would have to fix it and get it done. A lot of people didn't understand that they were very mechanically inclined, and that they could do mechanical type jobs, but they found that out in World War II. Consequently, a lot of companies elected to put plants down here who never considered moving to the South before. A lot of of people thought the South was a very bigoted place, red-necky place, still had a slave mentality, that type of thing, and I think they found out a lot different. I think we talked about

these people who came down from Buffalo who didn't want to go back. They wanted to stay down here. They liked the climate. They liked the fact that they had opportunities down here that maybe they didn't have up north. A lot of them just hung around till they died and got pretty good jobs. A lot of them went into their own businesses and things like that.

TS: Right.

TB: When I came to Atlanta in 1939, the population was just a little over two hundred thousand, but then it ballooned up to four hundred thousand. A lot of that was people who had come in and liked Atlanta and liked the fact that Atlanta was a booming-type city. There were plenty of opportunities here--opportunities for both men and women. And they elected to stay. Now we did get a lot of influx from our own state and from other people, because farming in Georgia was not on a big time scale, you might say. It was mostly small farms at that time. These people who put together these large combination land purchases and had big farms, they just put these small farmers out of business. They just couldn't compete. The cotton business, for example, went out to Texas. We still had some cotton here in Georgia, but it was very little.

TS: Right. Well, it has always been remarkable to me that the war could end and everybody be laid off, yet there didn't seem to be much of an unemployment problem.

TB: Things picked right back up again. As soon as they started letting people out of the armed forces, there was a lot of money around. People who had been in the armed forces had kept a lot of money. They had sent a lot of money home. They wanted some things. They wanted a house. They wanted that new car. They wanted a house with a refrigerator in it and washing machines. All this sort of thing. They had the money to buy it; and, of course, there was a lot of money made by civilian people during the war also. So all this pent up demand. There was a short period of time where people laid off didn't have it too good, but as soon as those war industries converted over to civilian production, man, they wanted people working there. They had to turn out these large numbers of appliances, of automobiles, of things that people wanted. I think the economy just didn't miss a beat, you might say.

TS: Well, are the factories moving south?

TB: Well, these were new hires, you see, because they had to have new personnel. A lot of the people up north who worked in these factories, if they closed a factory up north -- for example, they closed a lot of them around Lowell, Massachusetts–they didn't want to come south. They were afraid to come south. They were afraid to leave up there. There may have been a lack of jobs in the places where these factories were leaving or moving the headquarters or things like that, but not down in the South. They were really looking for people almost all the time down in the South to work. When I got out of the army, jobs were not hard to get, but jobs with a future where you could look ahead and see that maybe in ten years you could be doing this or you would have this type of job–there were not as many as those . Well, there never are really. I mean, you have to be lucky and be in the right place at the right time and have the right education and things like that to get jobs like that. But I remember when I got out of the service, I took a job as an electrician with a pipeline company. This was a products pipeline and the seers who ran the economy thought that the demand for petroleum products was going to hit rock bottom. They just couldn't see the need for all of that gasoline and everything.

TS: Were they wrong!

TB: Well, that's why it's hard sometimes to listen to people who talk so knowledgeably about the economy, because it is dependent on so many things. They had no idea about this pent up demand that came about after World War II.

TS: You spent two years in the Army?

TB: No, I just spent a little over a year.

TS: Did you do engineering work?

TB: No, I didn't. At the time I went in, they were letting people out. People over in Europe were coming through and were being discharged. What the Army needed at that time was educated clerks, and that's what I did. I was a clerk working in a separation center and worked out at Ft. McPherson here in Atlanta for about six months before ever taking basic training. I got to be a sergeant before I had ever had any training at all. So they just moved me right into this clerical job, and here I was telling people that they ought to re-up, and I had just gotten in myself, you might say. It was kind of funny. Then, after that, the Army put on a big push to get these young trained people, young people who could be trained in enlistments. The draft was still going on here,

and it went on for sometime after hostilities were over. So they transferred me to the induction center. Still out at Ft. Mac. I was assigning people to different places, figuring out the best job for them to do and that sort of thing.

TS: And then once you got out what did you do?

TB: I got out in August, and I went to work for a pipeline company in September and worked for them for the rest of the time. I went to work for them in '46 and stopped in February of '83. So I worked all the rest of my life with this pipeline company.

TS: What's the name of it?

TB: It's Plantation Pipeline Company. This pipeline originally went from Baton Rouge, Louisiana, to Greensboro, North Carolina. Then, during World War II, we operated a pipeline that the defense department built from Greensboro to Richmond, so that we could load tankers at Richmond with products from the Texas area and from the Louisiana area, and the tankers wouldn't have to make that long haul around Florida. They were sinking so many tankers during World War II right out of Jacksonville and Miami.

TS: So a pipeline would help?

TB: The pipeline went up to Richmond, so they could load tankers at Richmond and bring them down and go up through the Chesapeake Bay up to Philadelphia and places like that without getting out into the ocean. To show you, they shut that thing down, the part from Greensboro to Richmond. We shut down a lot of pumping stations after World War II, because everybody said that demand is just going to go to nothing. So when I went to work in '46 for them, the following year, we put all of these pump station back at work. We activated the pipeline from Greensboro to Richmond again, operated a pipeline from Houston over into Baton Rouge to give us access from that area. Some other companies built pipelines from Houston over to Baton Rouge, and we picked up products for them also. So it was a tremendous amount of money. It was just stagnant, you might say, just waiting to be spent.

TS: Now, you say you started out as an electrician?

TB: Yes.

TS: So, that was a step down.

TB: Well, actually, I made about the same amount of money as an electrician there than I did [as an engineer at Bell]. I went to work for $320 a month, and that was about what I was making as a Chief Electrical Design Engineer at Bell. But in the space of maybe three or four years, I was moved into the Atlanta office and worked out of the Atlanta office and then went back to Carrollton as a foreman of these electricians out there. I started doing construction work, but then moved to Atlanta in '56, you might say.

TS: What was your job when you came to Atlanta?

TB: The title was Electrical Engineer, and I worked under the Chief Electrical Engineer. But he and I were the only ones in that group. We had a lot of draftsmen and things like that, but we shared the draftsmen with other faculties like mechanical and civil. I guess, really, that was more of a technical job and didn't supervise anybody except maybe the draftsmen, you might say, told them what you wanted done. But I guess the first real supervisor job was what they call a chief dispatcher on the pipeline. We supervised the dispatchers. We talked to the shippers and made arrangements to handle their products and things like that. I had that job for a while. All this time though, anytime they had a construction program going on, I was always on the construction end of it. So I spent about half the time at Plantation doing construction work.

TS: Well, now, your wife worked at Bell, too?

TB: Yes. She worked in what they call the cardex section out there. She came to work about the same time I did.

TS: That's what you were talking about earlier, wasn't it? The cardex?

TB: Yes. The cardex system, where they kept track of all the different parts and all that were being used on the airplanes. When they needed to order more, the cardex had some sort of a tickler system that told you when you needed to order them. She had gone to junior college, Georgia Evening College, they call it here in Atlanta, for two years, and wanted to finish her education. So when I got married to somebody else in '44, she left and went to Northwestern and finished in '46, and she married somebody else. When my first wife and I split--her husband in the meantime died--so we got back together and got married in '75. So we've been married twenty-three years.

TS: Did you know her when she was at Bell?

TB: Oh, yes. We dated.

TS: Did you?

TB: Did a lot of dating. She wasn't exactly put out when I got married but it was kind of a bad thing. But I had been dating several other people at that time.

TS: About her job in the cardex part, was that mainly women that were working there?

TB: That was mainly women. They must have had fifty people that would fetch blueprints for you and would do all the filing work. There was lots of paperwork as you can imagine. They were mostly all women. The supervisor had come down from Buffalo. His assistant was a lady, and she had also come down from Buffalo. A lot of those people didn't understand how people in the South worked. Sometimes people in the South looked like they were going out of their way to do things a different way from what the other people had been taught. But you would get to the same end, and sometimes the southern way was better than the northern way. But, a lot of times, they wanted it done exactly the way that they had been used to. Of course, the people down here that could see that there was a better way didn't like that too much. But, anyway, the ladies worked all over the sections. They were keeping records, as I said, for the most part. But, they were technical records. I remember one lady had charge of what they called a vault, where they kept all of the transparencies. You see, they had to be kept in a fire proof room and all that sort of thing. She stayed in this room all the time all by her self with just a desk right in the front of this big safe, you might say. She just hated it, because she didn't see anybody. We were working from the prints rather than the transparencies. She was a very gregarious type of person, and she didn't have any company. So she didn't like it very well. So we had a big turnover at that job.

TS: Was the work force all White? Were there any Blacks?

TB: They were all White. I never saw a Black person in our department. I hate to say it, but the people that did the clean up work--that did the dirty jobs--were the Black people. But, there were no Black people in the engineering part. I never saw too many Black people working on the assembly line. They were all White. Before Bell started a lot of the Black people went north. We had

a big exodus of Black people that left because of the farm situation. They just couldn't make a living on a farm, and they went up north to the automobile factories. When the automobile factories stopped making automobiles they converted right a way to war work. So they stayed up there and didn't come back until after World War II. A lot of them never came back. I am sure that the southern states lost a lot of population of Black people between '35 and say, '41 at the start of the war, because there were no jobs here for them, and segregation was really tough down here. I grew up in a place where you had the separate water fountains, separate railroad station passenger waiting areas, and there was no question about it. The White area was a lot better than the Black area. There was no such thing as separate but equal down here in the South.

TS: Right. Just separate.

TB: It was separate and very unequal, but I thought that was a way of life. Although I lived very close to Black people. There were Black people that lived in our backyard in Augusta. The street right behind us, where we lived on Green Street, was all Black. So, we were in very close proximity to Black people all the time. But there was no social mixture at all. The Black people worked for the White people. Even during the Depression, we always had a Black person working for us with very low wages, maybe $3.00/week. But, of course, the White people weren't much better off. Let me put it that way. I never went to school with any Black people. I don't even believe there were any Black people in my class at Tech. Now, there were some people from Cuba and some people from Brazil and places like that, but there were no Black people.

TS: So Bell was just conforming to the values of society?

TB: That's right. I know that there was a lot of talk at that time about giving Black people a chance to do the work; but somehow or other, it just never happened. Now, there may have been some other industries where they had good jobs and did other than the janitorial-type jobs, but I think they were located much farther north than here. We still had a phobia about the Black people being inferior, and that's just the way you were brought up. You were brought up with the fact that you just didn't quite trust them. That they were people that you had to have, but you were always afraid that there was going to be something, as a class now, because you had individuals that you liked very well, but as a class you were always afraid that they were going to try to take over things.

TS: Did you get to know any of the big shots at Bell? Did people like did Jimmie Carmichael ever come around to see what you all were doing?

TB: He would come around and walk around with an entourage of some sort, but they were all in that first sort of temporary building [the B-2 building]. We never got back over there very much. We would go the other way toward the assembly plant, and every now and then they would come around. You would have a meeting or work would stop for fifteen minutes; and they would kind of give you a pep talk and say, "Okay, today, we have made our 100th airplane and it was finally accepted." That sort of thing and say, "This is a big day for Bell." But we never saw very many of those people like that. If you mentioned anybody other than Jimmie Carmichael, I wouldn't even know who they were. And the only reason I knew him is because he took over from somebody after the program started. Somebody moved away.

TS: Carl Cover got killed.

TB: Okay, and he was made the general manger, I guess it was. It happened while we were there, and so that is the only reason that we knew about that.

TS: So you only saw him from a distance?

TB: Yes.

TS: I was wondering, you were talking about him walking around. How well could he walk?

TB: He walked with canes.

TS: With two canes?

TB: Yes. As well as I remember, he had two canes, but nobody held his arms or anything like they did with [President Franklin] Roosevelt. I think he could manage with the two canes. I don't know how they [managed]; the building where we were was two stories, and the building where they were was two stories.

TS: It was. It looked like his office was on the second floor.

TB: But, now, they had a place where you could go from one building to the other on a level. It was a two story level, as well as I remember it. So he could go

across to our place.

TS: The statistics indicate there was a fairly large number of disabled people that worked at Bell Aircraft.

TB: Carmichael was one, of course, and we had one in the engineering department. The head of the radio group that had come down from Buffalo had a bad leg, and he dragged it around. There was a fellow from Atlanta that worked in the liaison engineering that had a bad leg like that. I think they did hire a lot of people that way. The people who did the assembly line work--like the electrical harnesses--sat in one place. So as long as they could use their hands, they could be handicapped with bad legs or have a leg off or something like that. But the people who actually did the work on the airplanes, generally speaking, had to be in pretty good shape, because they had to crawl around on the inside and outside. The messengers, people who went from one department to the other carrying plans and that went out into the plant, they could ride these little mopeds that we were talking about. They could get around pretty good even if they were handicapped to some extent, but I don't remember a tremendous number of handicapped people. The only two that I can remember in the engineering department were the two that I just mentioned. Now, they may have been handicapped in some other way, you know, eyes, hearing, things like that.

TS: Was there any big push to hire people who were handicapped?

TB: I don't remember any special program to do it. I think they were just trying to get people in the right slots. If they were handicapped, they looked at them and said, "Okay, we really don't need any at this time." Or, "We've got an opening here for a person who could sit in one place all day and take telephone calls and things like that; could you do that job?" So I think that was the way it worked.

TS: Well, I am just about out of questions, I think. I certainly enjoyed talking to you.

TB: Well, I enjoyed it, too. One of the things that we did mention and the fact that we did have a lot of older people--I can remember people probably in their 40's – I say older people.

TS: Well, you were in your early 20's.

TB: But, they were beyond the draft age. Also people in that time would have had maybe their own businesses just starting up and just couldn't get the materials. A lot of contractors couldn't build houses, you see, because they [the materials] went into building Army bases and that sort of things..

TS: Although in the Marietta area, I guess, you had a high priority for construction, because of all the people moving in [to work in the defense industry].

TB: Yes.

TS: Pine Forest Apartments were [built during the war] down on U.S. 41.

TB: That's right. I think they must have built a lot of them like that around different places. There was not much building going on in Atlanta. It was more like a doubling up type of thing. I think a lot of people whose husbands were over seas or in the Army, the ladies would come back and live with their parents or they would double up with their sisters or that sort of thing. In the boarding house where I lived for the most part during my time at Bell, we had three men--my roommate and I, and one other man who was married--and about seven girls. And that was probably the ratio in most of the boarding houses in Atlanta.

TS: Was this an old house?

TB: Old house at the corner of 13th Street and West Peachtree. All those houses are gone now. I lived for a while in some over on the 800 block of Peachtree, but they are all gone, of course. You lived with guys at that time, and nobody thought anything of it. Now, they will think you're gay and that sort of thing.

TS: Well, you hadn't moved that far from Georgia Tech to 13st Street.

TB: No, that's right, and, actually, when I was on the 800 block of Peachtree, I walked to school, because it was only during my last year that I went back to the dormitory and roomed with three other guys. Two of them were from Augusta, and this other fellow was from Waycross. He is the one that went to work at Bell with me.

TS: Anything else I should ask?

TB: No, I still dwell on the fact that those people that came down from Buffalo really wanted to stay here. A lot of them had to go back, because they had

family commitments in Buffalo; but it was almost like a death in the family when they had to leave, because they had made a lot of friends here. I think it was good for the people down here to realize that those people were not Yankees--what we considered Yankees--coming down here. They fit right in, and the southern people fit right in, too. So it was kind of a great big mixing bowl out there. I think a lot of respect for each other came out of that.

TS: My father- in-law says Buffalo was a good place to be from.

TB: Buffalo was a terrible place. It was cold in the wintertime. I think I told you that the fellow I had in marketing my last year at Tech as an elected course, told me that you had to know how people were in different parts of the country. He said, for example, the women in Buffalo had the biggest feet of any city that he knew of, so that if you were marketing shoes up there you had to get lots of big sizes, you see. You couldn't get these 4AAA's and things like that. But, they all looked just like the southern people down there. I enjoyed my work at Bell. I learned a lot of first hand information about electricity at Bell. We did a lot of theory work at Tech, but there was not much hands-on, except running laboratory tests and things. But, I learned a lot out there. It didn't do me much good later on, because this was all direct current work on airplanes for the most part. They had what they called a generator that got the 400 cycles that you needed for radio work, but all the rest of the controls were direct current. That's probably not the case anymore. They are probably using alternators and everything. But they had generators on the engines with battery back up. A lot of people probably don't realize that. All automobiles used to be all direct current, you see. They had a generator that generated direct current and used a battery back up, but then they got to where they found alternators that would work just as well. Of course, your battery back up is still direct current, but you're normally generating alternating currents.

TS: So it is quite different than anything else that you would do?

TB: Yes. When I went to work for the pipeline, for example, we didn't use any direct current. So it was a lot different. The machinery was the same, but the motors were the same as what we had studied the theory on. But the practical work that I did out at Bell, there's not much use later on.

TS: You were never tempted to go to work at Lockheed.?

TB: They offered me a job back in the 50s, I guess it was. This was a routine

thing, and I am sure they looked up everybody and just sent them a form letter, because they were hiring a lot of people at that time. But, no, I was better situated, I thought. I liked pipeline work, and that's the reason I stayed so long. I just loved it. I liked the people. We went through a period of automation beginning in 1951. The first fully automated pumping stations, nobody there at all, and I was in on all the design work on that. So there was always something new coming up in pipeline work. I enjoyed it. I like the actual construction of pipelines, being out in the field and seeing the things being done.

TS: Well, I certainly appreciate you coming out here today.

TB: Dr. Scott, it has been my pleasure. I've enjoyed talking about it.

TS: Well, I have, too.

TB: It is kind of like a jig saw, I guess. We would jump around from one thing to the other. But I had made some notes before I came of things I thought you would want to talk about, and we hit them all..

TS: Well, great. We'll talk to Frances sometime about her job, too.

TB: Okay.

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