

Heimburg, Karl. November 9, 1989. Interviewer: Michael Neufeld. Auspices: DSH. Length: 4.25 hrs.; 81 pp. Use restriction: Open.

Heimburg discusses his birthplace and early education. Discusses engineering education at the TH Darmstadt; university requirement and importance of practical experience in German engineering education; deficiencies in practical experience of American engineers. Manufacturing of Redstones in Huntsville and industry objections. Opposed to Hitler. Leaves for job in Japan after getting in trouble with authorities (1936-37); travels through Soviet Union; experience in Japan; departure from Japan, June 1941. Interlude at Stuttgart and Karlsruhe before drafted; assignment to the Versuchskommando Nord at Peenemünde. Hired by Ludwig Roth for Project Office; Roth's personality and management style. Involved with A-9 (A-4b); first launch and failure. Wasserfall: origins of and assignment to; work on test stand and floating test stand (Schwimmweste). Discusses von Braun; initial impression; advocates underestimating costs to sell projects; forced to wear SS uniform; arrest with Gröttrup and Reidel II. Discusses Zanssen's disapproval of regime and removal. Saved central records to use as bargaining chip; evacuated by Americans.

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Interviewee: Mr. Karl Heimburg

Interviewer: Dr. Michael Neufeld

Location: Huntsville, Alabama

Date: November 9, 1989

TAPE 1, SIDE 1

DR. NEUFELD: Mr. Heimburg, could you give your full name, your birth place, your birth date?

MR. HEIMBURG: My full name is Karl Ludwig Heimburg. I was born at Lindenfels in Hessen. My dad was a forester. Therefore I grew up in the countryside. And my father was transferred close to Giessen, close enough so that we could go by train to school at Giessen. I was the youngest one of four. This transfer was in 1914. I was born in 1910.

NEUFELD: Your exact birthday was?

HEIMBURG: 29th of January, 1910. I went to school at Giessen, and after finishing the Realgymnasium at Giessen in 1928, I went to the Technische Hochschule at Darmstadt, after I had practically worked for half a year at Krefeld in a steel plant. The German technical education asks for a practical education as an electrician or as a mechanic, and describes in detail where you have to work at a minimum of time, and this in my opinion is a very important educational side which is missing in the United States. Some of the industries here get their young engineers to get that education too, but these are not too many. I was out of Darmstadt for a year since my oldest brother had bought a roofing paper plant. He was a physicist, had worked outside of Germany, and when he lost his job in 1932, he rented a roofing paper plant business. But he got a job again in his old industry and I had to make roofing paper.

NEUFELD: OK, can I stop you for a minute and just fill in some details from before? When you went to the Realgymnasium, which was certainly more science-oriented or more modern oriented than the traditional gymnasium, right?

HEIMBURG: You know, you had three different schools. You had the Oberrealschule, and the Oberrealschule had only French and English, as foreign languages. The gymnasium was the opposite. They had Greek and Latin and French. And the Realgymnasium was something in between. My dad graduated in a gymnasium and he found out that this was too far away from reality, and therefore

he sent his three boys to the Realgymnasium, where you had Latin and French and English, but Latin I had for nine years, while French only for six years and English only for five years. But still I do not regret this kind of education. I think this is a healthy deal for youngsters, even in retrospect, and even, even that I was not a very good student, especially in languages, and languages, I was close to zero. I was pretty good in mathematics and physics and chemistry. And in languages, I worked only as much as I had to.

NEUFELD: That was more or less my inclination. But it is amazing to Americans that so many languages were taught. The requirements are really higher than high school here.

HEIMBURG: The requirements are higher, and I still think this healthy. You know, when you went to a gymnasium, you had to pay a monthly fee. It was not very high. It was in my time 15 marks per month. To that came 10 marks for the transportation to these so 25 marks per month for school. Today, they have created far more universities in Germany, and now you have an unbelievable amount of academically educated people, which in my opinion is not a healthy thing. But I see it only from the outside. I do not see it from the inside. And the discipline in school, I do not regret either, you know. My dad simply said, "All right, I do not pay a second year. If you have the capability to do it and don't want to, that's your business, and I pay one year." So I never repeated a course, and even in the school they said they never had that, a family with three boys, none of them repeated a year. But this was our dad. He was very clear and outspoken. "I pay only one year." This was not a threat. This was strictly a statement.

NEUFELD: As a forester, was he a civil servant of the state of Hessen?

HEIMBURG: State of Hessen, right.

NEUFELD: OK. So did you have an inclination towards engineering before you went to the Technische Hochschule? Did you find yourself interested in technical subjects at the beginning?

HEIMBURG: I was interested in technical subjects. You know, my eldest brother, he wanted to go in forestry too, and my dad refused that. He said, "Look, that profession is over-filled, so you will get your first paying job when you are at the age between 30 and 35. And since you have brothers and a sister behind you, I cannot pay for that. Therefore you have to take a different job," and he went into physics. But he did not want to go into teaching; therefore he went into industry, and just more or less accidentally he went into geophysics, and --for example, he was here in the United States in Texas for one year, and they

found two salt domes. You know, they measured that out and said, "OK, you drill here, here's a salt dome and here's a salt dome," and he was in South Africa for four years, and he was in Russia during the war, in the oil fields.

NEUFELD: Which war, the Second World War?

HEIMBURG: Second World War.

NEUFELD: So he was involved with oil exploration?

HEIMBURG: Oil exploration, yes.

NEUFELD: So you went to Technische Hochschule at Darmstadt. And you became a Diplom-Ingenieur.

HEIMBURG: Diplom-Ingenieur.

NEUFELD: In which subject?

HEIMBURG: Mechanical engineering. Just general mechanical engineering. And after that I got a job at a coal mine. Not underground but above ground, you know, coal mines that produce their own steam and produce electricity with the coal which they cannot sell, the ash content is very high, and sell the surplus to the outside, so there are quite a few jobs above ground on a coal mine. And I was there for about a year.

NEUFELD: 1928-29?

HEIMBURG: That's when I was at the Technische Hochschule. 1928 to 1935. In 1935 to 1935 I was in the coal mine.

NEUFELD: OK, I had mixed up the date of your exit from Realgymnasium, so you started the Technische Hochschule in 1928.

HEIMBURG: 1928, autumn of 1928, after I had worked for seven months at a steel plant at Krefeld.

NEUFELD: Now, I have the question about the practicum that comes with German engineering education, because I'm trying to learn more about that. Obviously many people who went to Peenemünde did the same thing.

HEIMBURG: Strictly speaking, if you went into a technical field, each college or Technische Hochschule requested that you had to work practically. At the Technische Hochschule you had to have a minimum of one year before your final examination, and to enter the Technische Hochschule you had to have a minimum of 6 months. And as I mentioned, in my opinion, practical education is a necessity for engineering personnel, and we of course saw that

here, and not only engineers but we also had mechanics and electricians with us. So in the shops and not only in the shops but also in design, we saw, something is amiss, if the people didn't have any practical experience, you know, for example in selecting material. Not only that but also, how do you do that, do you manufacture that this way or this way or this way? And there we had constant difficulty between design and shop because the man in charge of design and the man in the shop, mechanic, the mechanic told him, "Look, we do not do it this way, we do it this and this way because we can do it in a shorter time." And of course, the designer didn't like to be corrected by a mechanic. But this was only very obvious, you know, and very often I got complaints about that, and in looking at it I could only say, the man in the shop was absolutely right.

NEUFELD: Just one question: are you talking about the United States period now?

HEIMBURG: Yes, right. That was here in the United States. Here at Redstone Arsenal we had shops and we manufactured the first Redstone missiles at the arsenal, later on the manufacturing was done by industry. But the first were manufactured here. By the way, this is something which the industry didn't like at all, that we did that, because we could clearly say, "Look, that doesn't cost that much, come on, you reduce your price." This of course industry didn't like. And therefore finally the testing and the manufacturing were cut out. And the testing came back later on again, since a year or two years say, test again, but before, testing and manufacturing was completely kept out. And this is a big danger for the young engineer. You hire the young engineers now at NASA. If they do not manufacture at all, where does the young man learn how to do it and how much it costs? So there is, in my mind, and I'm aware I'm subjective here, a discrepancy, in the engineering personnel. Well, I could imagine, and I have talked with some of NASA people, that when they hire a young engineer they should first take him in mechanics, learn how to work on a lathe, the different machinery, for a year even and have a contract that if they stay for ten years, they do not have to pay anything back. If they leave before, they have to pay back that year which the government have paid for them, because that was educational deal. Nobody wants to hear anything about it. They say, this is a subject of the government, not of us. You don't have to do it.

NEUFELD: So as far as you are concerned, the American engineers have very little experience, graduate from university when they have engineering, have very little practical experience when they come.

HEIMBURG: Right.

NEUFELD: And the German system therefore you think gave a better background.

HEIMBURG: Yes. I give you another example, which we had on the test stand. You know, the young engineer has to have a feel, if you do that job, how long does it take? And our young engineers did not have that, so the mechanics and the technicians all were out for overtime, and we were unable to educate the young man in a short time to get a feel for it, how long does it take to do such and such a job?

NEUFELD: So as far as how this worked when you were in Germany in the 1920s and thirties, did the Technische Hochschule arrange for your particular employment, or just said you had to go out and find something?

HEIMBURG: No, you had on your own, you had to find something. You had to show you worked for so many months as a mechanic, for so many weeks on a lathe, for so many weeks on that machine, for so many other weeks on that one, for so many weeks at a model making shop, for cast iron plants, I worked in a cast iron plant for a few weeks. And I worked at a blast furnace for so many weeks. You know, the Technische Hochschule prescribed only, you have to have a minimum of so many weeks there, of so many weeks there, of so many weeks there. If you had more, that was all right. Only the minimum was prescribed.

NEUFELD: So if you were in electrical engineering, then you'd have a different set of prescriptions about --

HEIMBURG:--right --

NEUFELD: --or chemical engineering, about how much experience you were supposed to have had.

HEIMBURG: Right.

NEUFELD: How was that arranged with the companies? Did they pay you very much for those positions when you came?

HEIMBURG: When we were working, we were paid for it, but just to give you an idea, I got 23 pfennig, pennies per hour, 57 hours per week. And of course it was 1928, and that was money that the young people when they came out of school, at fourteen, they got 7 pennies, second year, 14, third year 23, fourth year, 50 something.

NEUFELD: Those rates you're quoting are for apprenticeships?

HEIMBURG: Apprenticeships.

NEUFELD: You're talking about apprenticeships for skilled worker jobs.

HEIMBURG: Right. Right.

NEUFELD: So that you received as a sort of --

HEIMBURG:--they paid me the third year.

NEUFELD: Equivalent to a third year apprentice.

HEIMBURG: Right.

NEUFELD: For the engineering student worker. Is there a specific position like that, or you just had to find a job?

HEIMBURG: I had to find a job.

NEUFELD: I mean, in companies did they have specific positions set aside for engineering students?

HEIMBURG: They called them Praktikanten. And many of the plants had jobs for them which changed practically every year, but they had say three or four openings for Praktikanten. For future engineers.

NEUFELD: Now, I had another question before we go forward with what you did. In talking to some other people here, and Arthur Rudolph in Hamburg, I've noted that there was sometimes some tension between the Diplom-Ingenieur and the Fachschulingenieur, that you had this different kind of engineer, the two year Fachschule type engineer.

HEIMBURG: Yes.

NEUFELD: What was the training of the Fachsulingenieur, how did that differ, and was there tension?

HEIMBURG: The Fachschulingenieur had, before he entered his Fachsule, two years of practical experience, against the future Diplom-Ingenieur only had to have one. And yes, there was some discrepancies. For example, in the design, when you started in the design, the Fachschulingenieur had an advantage against the Diplom-Ingenieur because he had by far more praxis in the school already than the Diplom-Ingenieur. But that took some time, and then this was overcome. And I personally, maybe I should mention that, generally in Germany it's said a young engineer should start out with a board before his head, in design, and should stay in design for at least two, three years, before he does something else, and I personally agree with that. This is in additional education, if you go into design, and I give you an

example, which shows you that in spite of your practical experience, you still make your mistakes as a young engineer. For example, in Japan, I designed chemical plants, and one day, one of our let's say, I call them engineers but they were not engineers, those who assembled the plant, came to me and said, "You made a mistake, in showing a ditch for piping, and there was only one pipe." So I made the ditch not wide enough. And he said, "You show me now how you bring in the pipe, and you fasten your flanges with boards. How can you do that in that space which you provided?" And it was built that way and he was absolutely right. You know, no matter if you have one pipe or you have more, you have to make it bigger so that people really can work into it. That's just an example. In practical experience, these are mistakes you still make in your professional life, and you make those one time only. That one, this is it. OK, that was design. Young engineers should start out in design, and then go on from that anchor, in professional life.

NEUFELD: Did the -- I gather that at least among some people at Peenemünde, that there was sometimes tension between Fachschulingenieur and Diplom-Ingenieur, or that some Fachschulingenieur felt that they weren't treated as well, not so much because of anything about Peenemünde, but just because of the different kinds of education in Germany. Do you think that was true?

HEIMBURG: You know, that depended on the people. And I would be very careful in generalizing that. It could come up. And you know, one person reacted differently than the other person. Once in a while it came up, but you know, if you have contrasts, then it came up completely different. I give you now an example of that. You know, early, in '42, I was on a test stand, and the V-2, as we called, it the A-4, was relatively new and had still many, many, many shortcomings, and it took a long time until you could really run a test, and then the test runs were relatively short, because something went wrong. You know, just to give you one example, in the oxygen valve, you had to be very careful with the tolerances, in the oxygen valve. You had to be careful that it was tight. On the other hand, if it was too tight, it didn't work properly. And it took quite some time until you had overcome that difficulty. But there were many other things, and our boss at that time was really a young inexperienced engineer on the test stand. He had asked me, you write down whatever comes up, and I wrote that down, and he looked at it and said, "I like that. Now, you do me a favor. You write behind it who's responsible for that, which shop had manufactured it, you write behind it the responsibility." And I did that. And then he published that report, and there I was, within a few days, known all over Peenemünde, he was the one who wrote that report, because that offended quite a few people. So that was a first step in quality control. And he asked me then, "Look, we have to

create a quality control group. Do me a favor, you do that." I said, "OK, I can set it up. But I do not want to stay in there. I want to be on the creative side, not on the side of those people who only criticize others. This I do not like. I see the necessity, that this has to be done, but I don't want to do that." So after three or four months, you know, I went back again, and somebody else did that. But that was the creation of quality control, which we didn't have at that time and which was created only out of experience.

NEUFELD: I asked the question about the Fachschulingenieur, and I want to come back to your own life in the 1930's, but I asked that question because from talking to Rudolph and then one or two other people, they seem to say there was a difference. For example Papa Riedel I, he --

HEIMBURG: --oh yes --

NEUFELD: --he resented the Diplom-ingenieur, but on the other hand --

HEIMBURG: You are right. This is, now I know where you got it from.

NEUFELD: And Rudolph didn't.

HEIMBURG: Riedel was outspoken against Diplom-Ingenieurs. OK. Have you ever heard of Tessmann?

NEUFELD: A little bit.

HEIMBURG: You know, he's my neighbor here. He worked with von Braun I believe since 1934, and there you can hear a few of those stories, against the Diplom-Ingenieurs. And I know that Rudolph had once in a while some gripes too. But Rudolph was very well experienced. There's no question, in experience he was tops. And once in a while he had something to say against Diplom-Ingenieurs.

NEUFELD: Yes, he didn't say that in his interview, but you consider that more of a problem of individuals rather than generally throughout industry and so forth.

HEIMBURG: Yes. I certainly would not generalize it. I would say, these are individuals and the experience of the different individuals, because there were of course Diplom-ingenieurs who were not the best, that they had a right to criticize, but again, they could not or they should not generalize, one or the other experience.

NEUFELD: Do you know if there was a lot of essentially snobbery

or something, so Diplom-Ingenieurs were putting down the other type of engineer on the grounds that they weren't --

HEIMBURG: No, I don't think so.

NEUFELD: OK, now, we got a long ways off but it was very informative for trying to understand German engineering and engineering education.

HEIMBURG: I tell you another story. You know, on the test stands, we had the difficulties that the young engineers could not judge the work of the mechanics, and this of course cost quite some money, and this brought me on the idea, damn it, the American engineers should have practical experience too, which would help not only in judging the practical side but also in the design. In the design it was the same thing, that if people had not worked practically, it was difficult for them to go with the people in the shops and discuss the work which they had done. Now, most people were clever enough and learned by that from the mechanics. OK. I see your point, I did that wrong. The same thing is, you know, young engineers come with one solution, they do not see that you can approach a problem from different angles and you can do it this way and you can do it that way and you can do it this way, and the people in the shop usually came out and said, "Look, when you do it this way, then it's not as much work than if you do it as you have it in mind." OK. This took some years, until the people had learned that. My point is they should right from the beginning bring this experience along.

NEUFELD: In American engineering.

HEIMBURG: In the American way, yes.

NEUFELD: OK, so to try to get back to where we were in terms of your own life, you finished at Darmstadt in 1935.

HEIMBURG: Right.

NEUFELD: Did you immediately go into your brother's business, take over your brother's business?

HEIMBURG: No. No, no. This was during my studies at the Technische Hochschule. You know, that in between, I believe that was 1932, my brother said, you have to take over that job, and I had to stop at the Technische Hochschule, which I didn't like at all, but my mother was very strong and said, "Look, you have to do that job for your brother, since he is in his old job, and on the other hand, we do not want to give up that roofing paper plant." But that took me out of the studies for a year, and it took me quite a while to come in again, because all the people with whom I had worked before were by then gone. They were not

there any more. They were further advanced. So, in this respect, this was something I didn't like. And besides that, that was at a time you know when Hitler came to power, and you were thinking, what is that now? What do we experience? And you know, just as a sideline, at that time every third one was without a job. Right after the war, I was in a camp, before we went to the United States, close to Frankfurt, and in this camp was Hjalmar Schacht. He was the finance man of Hitler too and he was in the finances before Hitler came to power, and Hitler had thrown his finance man out and had used Schacht. And I asked him, and Schacht told me at that time, this was highly interesting for me, he had tried to convince the people before Hitler came to power to build streets and in doing that to get rid of the unemployment, and he said, "We have the money, we can do it." And they refused. And Hitler accepted that gladly, and Hitler's power grew from that enormously, because all of a sudden the unemployment was gone. This was for me highly interesting, to hear that he had tried that before. If they had done that, then Hitler would not have come to power. That would have worked. But --

NEUFELD: There were many mistakes made under Bruening and under Papen that were disastrous.

HEIMBURG: Exactly. That's what I wanted to say with that.

NEUFELD: Do you mind if I ask you how you felt when the Nazis came to power? Because I know many people were opposed, and other people felt, well, maybe we have to do something about the situation, the unemployment.

HEIMBURG: I had quite a few things against Hitler. In my opinion, he was an adventurer. And I had mentioned that once, while I was under alcohol, and I suffered from that. And that was the reason that I went to Japan. I had to leave Germany. And quite a few of my friends said, "You have to go in the party. You have, all what you have in mind, you have to criticize from the inside, not from the outside." And I could only say, "Look, even if you go on the inside, you never would come through, therefore that doesn't make sense." So I was from my side not a supporter of the radicalism. I saw quite a few things which had to be changed. There was no question about that. But I was not on the radical side.

NEUFELD: So this incident that you were saying about was after you were out of university.

HEIMBURG: That was already when I was out of the university. That was the reason I had to leave the coal mine. I had to get another job. And a friend of mine, he got me that job in Japan. He said, "You'd better get out of here."

NEUFELD: So you were at the coal mine from 1935 to --

HEIMBURG: Well, it was just this one year, 1935.

NEUFELD: '35 into '36.

HEIMBURG: Yes, right.

NEUFELD: And then in 1936, was that about the time that you accidentally said too much?

HEIMBURG: Yes. And I was then in the design office in another city and from there I went into, this old friend of mine got me that job in Japan from a German company. By the way, that story I told you now, nobody knows here. I never told that to anyone because in effect what I did was just plain dumb, that's all I can say. But this is the way and that's the reason I told you, that was the reason I went to Japan.

NEUFELD: At the time that you said that, did you come under direct pressure from the police?

HEIMBURG: Oh yes.

NEUFELD: Or the party?

HEIMBURG: Yes.

NEUFELD: So you were investigated.

HEIMBURG: I was investigated. And that may interest you too, how that system worked at that time. You know that where I worked, there was a colleague, another engineer. His brother worked in Berlin in a Sondergericht special court. And all these cases, as mine, came to this court to Berlin. I was not aware of that. His brother could get rid of my problem, and the city, the judge in the city was advised, the case is dismissed. And when I went, since I need a passport, to go to Japan, I had to go to the court to get permission for the passport, and he told me, "Look, you have a case against you and that's not resolved." And I told him, "Would you please open your mail of this morning?" And there was a letter from Berlin. I knew that through this friend of mine. Right? And he opened it, and he turned pale and said, "You are right. Here's the letter." And he was surprised, how in the hell could he know that this letter was in the mail?

NEUFELD: That also illustrates just how much luck has something to do with it. I mean, with a different set of circumstances, they might have thrown you in jail or something.

HEIMBURG: That's right. Under normal cases I would have gone to jail for two years.

NEUFELD: So that was at least lucky that you had the connections.

HEIMBURG: That was just plain luck. Just plain luck. OK, that was a sideline. Now you understand why did I go to Japan.

NEUFELD: That's a very interesting story. So you went to Japan in 1937?

HEIMBURG: 1937. To Tokyo.

NEUFELD: How did you travel at that time?

HEIMBURG: Through Russia.

NEUFELD: You traveled across the Soviet Union.

HEIMBURG: Yes, right.

NEUFELD: You probably didn't see this, but it was right in the middle of the purges and so forth. It was a very --

HEIMBURG: Yes, it was in the middle of the purges in Russia. You know, at that time, Stalin held it against the military, and he killed the top military officers of the Russian army. You know, we had in that train a lady accompanying the travelers, and there were four Swiss people and some German people, and we asked her of course, what in the hell is going on here in Russia? And she defended Stalin. And we could only kid her. But this was quite interesting. You know, you were in that train six days.

NEUFELD: On the Trans-Siberian --

HEIMBURG: Yes, Trans-Siberian. Yes.

NEUFELD: That's an interesting experience. I guess I shouldn't go on about it because it's not very relevant to this interview, but I find the experience fascinating. So you arrived in Japan in 1937. Was it clear at that time that there was any connection between Nazi Germany and Japan that had something to do with your going there? Or did it really have nothing to do with it?

HEIMBURG: That had nothing to do with it. You know, Japan was on the poor side. The reason was, Japan didn't have any coal, and didn't have any iron ore. Manchuria had it, and that was the reason that the Japanese went into Manchuria. This was quite interesting. You know, you had here a place, a mountain with iron ore. You did not have to go underground, you just took it from the mountain. And the same thing was true for coal. You didn't have to go underground, you could take it out, really, the best coal.

NEUFELD: Right on the surface.

HEIMBURG: Right from the surface. And you know, the general planning was done by the Japanese. The detail planning was done by the Germans. And you had here the iron ore and here the coal. And you would say, OK, so I built here some blast furnaces and I built here some blast furnaces, and the distance, it will come by trains, and you could load on one way the coal and on the way back with the ore. But they didn't do that. They built twelve blast furnaces on one site and went back with empty trains. That was none of our business.

NEUFELD: This was in Manchuria.

HEIMBURG: In Manchuria. The German engineers built only the blast furnace and what all belonged to it. You know, we built our product plants of coke oven gas, you know, coke oven gas has fertilizer, has toluene, has benzene, has quite a few things, and this is what we took out of the gas. This is what I did in there.

NEUFELD: So you were involved not, but you weren't in Manchuria, or did you travel there?

HEIMBURG: Only one time. This was all handled from Tokyo and we had our engineers in Manchuria.

NEUFELD: So you were involved primarily in planning, or were you also involved in construction of chemical plants inside, in Japan proper?

HEIMBURG: In Japan too, because they brought in coal from the outside, and they had, for example, I take it as an example, Osaka, a big plant to create the gas for the city, and of course, there you used the coke too, for different purposes, not only for industry but for private purposes. We built a plant in Osaka. There were a few other cities where we built plants.

TAPE 1, SIDE 2

NEUFELD: So, I interrupted you. As far as the Japanese period was concerned, I am just a little curious, again, describe your experience there. What was Japan like in those years?

HEIMBURG: You know, from the political side, we, the Germans, cared very little about it. This was their business. And you had the Emperor there, and you knew that the military side was actually in charge. As we saw it, Japan had three parties. One was industry, one was the army, and the other one was the navy, and they had very strong navy too, but the army was in charge, and they tried to change that so that the industrial side would

take over. And that didn't work. So the army dictated. So otherwise, we knew very little, and we saw, for example, one thing. You know, the ambassador, the German ambassador in Tokyo was Dircksen. And he was transferred to London during that time, while I was there, to London, and the Japanese asked that the military attache, the German military attache, would take the ambassadorship, and the Germans obliged, so Ott became the ambassador. You know, when war broke out, I should tell you that because it might interest you, a little story. We were invited into the German embassy, and Ott, the ambassador, gave a speech, and said, "We want to handle that differently than in the First World War, where everybody tried to go back to Germany. You stay where you are. Everybody is a small wheel in that big gear of the German Reich," and behind me somebody said, "And I am only a little grease hole," and in that moment, you know, the seriousness of the situation was gone. He said, "I'm only a grease hole." OK.

NEUFELD: That was at the beginning of the war in Europe in 1939.

HEIMBURG: Of the war, quite.

NEUFELD: So you stayed there, you were telling me before we started the interview, you stayed there till 1941.

HEIMBURG: 1941. One thing you might be interested, too. Japan from the countryside is beautiful. It's a beautiful country. And some of my friends and I were, over the weekend, we hiked quite a bit, and skiing in wintertime was excellent too, which we did. So from that side, I enjoyed Japan. There's a Japanese proverb, "Who was never on Fuji-San, Mt. Fuji, is dumb. Who goes there twice is dumb too." I was on Fuji-San twice. You know, the first time when we were up there, we didn't see anything. It was all clouded up and we decided we have to repeat that, so we went a second time, where we had beautiful weather conditions and an excellent view from the mountainside.

NEUFELD: The word was "dumb" ? The first time you go you are dumb in the sense of can't speak? And the second time? Because I didn't quite hear you.

HEIMBURG: OK. I have to give an explanation here. The Japanese do not have cuss words. Only the police. And the police can say, "You are really dumb." And they have a few other words. The Japanese himself does not have cuss words. The language doesn't have it.

NEUFELD: I'm just saying, in terms of, I didn't understand, I didn't quite get the proverb. It says the first time you were on Mt. Fuji you're damp or dump?

HEIMBURG: Dumb: you have no brains. Right? Who was never on Mt. Fuji has no brains. And who goes there twice has no brains.

NEUFELD: In the sense that you were totally awe-struck by it?

HEIMBURG: Right.

NEUFELD: OK. One question I have about that is, you gave one illustration of learning from the engineering experience there, you know, of proper design. What was the --what did the Japanese experience with that construction contribute to your Peenemünde engineering?

HEIMBURG: We had in that office quite a few designers. Not only draftsmen but also designers who were very good. But I never went into details about their education.

NEUFELD: What I'm asking you is, what did you learn from an engineering standpoint in Japan which was applied to Peenemünde test stands? How was that experience influential later?

HEIMBURG: OK. When I came to Peenemünde I came into the Proseco DPT. There was the idea to provide the V-2 with wings, and in doing that, giving the V-2, gliding, considerably bigger range. And I was told, OK, we create three different types, and that vehicle which we designed was an A-7. You may have heard that we started out with an A-3 and then the A-3 couldn't provide the guidance as it was provided, or should have been provided for the A-4, couldn't carry it, and they therefore created the A-5. And if you would now give the A-5 wings too, that would be the predecessor of the A-4 with wings.

NEUFELD: Yes, which was the A-9.

HEIMBURG: OK. We had three types, one without any power plant, just dropped from aircraft, to study the gliding capabilities of that vehicle. And the second one with the power plant of 1000 KG dropped from the aircraft, and the third one with 1500 KG power plant starting from the ground and then glide. And I was in charge on the drawing board of the A-5 coming from the ground. And when I had finished this design, the boss liked that and he called von Braun. Von Braun looked at it. He liked it too. And he asked me, "Would you be interested in taking care of that project completely?" I said, "Yes, definitely so." So we had that vehicle just on the test stand when it was cancelled, as we were told at that time, well, the war won't take that long, and therefore that doesn't make sense any more, to create such a vehicle. So it was dropped. And in that project department, I was wondering what we will do now, and I should tell you one story before that. You know, I was drafted in the army, and came to Peenemünde as a buck private.

NEUFELD: OK, that's where, I should actually fill this in completely. We got off track. OK, so you came back from Japan on leave, was it?

HEIMBURG: On leave for five months.

NEUFELD: OK, in which month? You said just before the attack on the Soviet Union?

HEIMBURG: On the 10th of June, I was still in Moscow, and the war between Germany and Russia broke out twelve days later.

NEUFELD: So you just came back.

HEIMBURG: I just came back. And you know, of course, you could see while being on the train, something is going on here. And my brother was in Berlin and he asked me, "What do you think of that situation?" I said, "That's plain bluff." And I had been told, the war is imminent, in the train, by two people who were traveling with diplomatic information to the East, you know, even to South America, and they had told me the war is imminent. And when we were in Moscow --

NEUFELD: Germans told you this?

HEIMBURG: Germans. They told me, "Well, we still can make it." They were afraid we couldn't make it any more. They told us in Moscow, "We still can make it," and I didn't believe that. And I told him so. "If Hitler does that, he has lost the war." And I don't believe that he would do that. And so I told my brother, I cannot believe it, he's not that dumb. Well, OK. I went then to the Technische Hochschule Stuttgart to get coal chemistry, because I was in the coal business but I was a mechanical engineer and I wanted to know the chemical side of the coal too. So that's what I did for five months. Then after the five months were over, I got my first draft order, and I went back to the company which had sent me to Japan, and they said, "No, no, we can get a cancellation of that draft order," and they did. I got a second one. They cancelled it. And the third one, you know, the other side said, "You cannot say he is absolutely a necessity here because he wasn't here before. So you don't have a reason to come out with an argument."

NEUFELD: That would have been at the end of 1941?

HEIMBURG: That was in October. No, that was already '42. That was in '42.

NEUFELD: So you were at Stuttgart for the fall semester of ?

HEIMBURG:-- Karlsruhe. I was not, I worked with a professor there as an assistant, and I got that information as an assistant of that professor, so I was not going into classrooms.

NEUFELD: So that was the fall of '41.

HEIMBURG: That was the fall of 1941. I went back in the fall to the company in Recklinghausen, and I stayed until the third draft order, and that was in February. In February of 1942, I went into the army, and was sent to France, and was for six weeks in France, the first three weeks in Germany and then another three weeks in France, so it was six weeks total. And then I was sent from France to Peenemünde, a name I had never heard before. It was completely new to me.

NEUFELD: You then had no personal connection that resulted?

HEIMBURG: No personal connection.

NEUFELD: So you have no idea who said "Assign this person to Peenemünde." How your name was picked to go, since you had no knowledge of it.

HEIMBURG: I heard only later that Peenemünde needed personnel with experience, and therefore they looked over the list of draftees, and then put their mark on those draftees they wanted to have, and then these were transferred to Peenemünde.

NEUFELD: Were you assigned to Versuchskommando Nord?

HEIMBURG: Versuchskommando Nord. VKN.

NEUFELD: Yes, VKN. Did you -- I haven't yet been able to pin down exactly when that unit was created. Have you any idea? Or it just existed when you got there?

HEIMBURG: I have no idea when it was created. And Rees would eventually be able to answer that, that question. Maybe. Maybe not. I do not know.

NEUFELD: I don't know if I asked him yesterday specifically about that. I may have missed it.

HEIMBURG: Rees would be I think even the only one who could answer that question, who could eventually answer that question.

NEUFELD: I'm hoping that it will turn up in the German documents. But I'm not clear on that now.

HEIMBURG: You know, that was really interesting, and absolutely against the German custom in the army. You know we had one

company with Diplom-Ingenieurs only in the company, and only two in one room, because General Dornberger, he was responsible for that, said, "If I want men to behave like ordinary engineers, I have to treat them that way. If I don't do that, I cannot expect that they would be interested in their job." So that was quite interesting, something completely new in the German army. And the old non-commissioned officers didn't like that at all!

NEUFELD: So I gather that the rank didn't mean much of anything once you got there.

HEIMBURG: No. It didn't. There was some, where you could feel, OK, he's a buck private so there cannot be much with him, otherwise he would not be drafted into the army. But their idea was, this was only some, very few. Only those who were superfluous on the industrial side were drafted into the army. But that's really --

NEUFELD: You said some NCOs didn't like it. These were people who were not engineers, who were just assigned to military administration or something?

HEIMBURG: Yes. Right.

NEUFELD: And they found the whole situation strange, I assume.

HEIMBURG: Yes.

NEUFELD: Because you had assigned jobs without any regard to rank, so that you could have a private over a lieutenant or something like that?

HEIMBURG: Right. It was interesting, you know, in that at Peenemünde I was ahead of two lieutenants. They were in uniform, and I was in uniform too, but you know, on the official side, I was ahead of them. Maybe I'm a little bit too early in mentioning that. You know, when war broke out, von Braun went to Goering, and told him, "We need an anti-aircraft rocket."

NEUFELD: This is 1939.

HEIMBURG: 1939. "We need an anti-aircraft rocket." And Goering told him, "Young man, wir machen das mit Jaegern." So he didn't accept that.

NEUFELD: Let me just translate this for other people. "We do that with fighters," right?

HEIMBURG: We do that with fighters.

NEUFELD: OK, for anyone who can't read German.

HEIMBURG: That's right. By the end of 1941, they came out, "We need fast an anti-aircraft rocket." And that was the Project Wasserfall. And they had said, "Look, if you take another project, we need personnel to help us." And so all of a sudden we got air force personnel in uniform, two lieutenants, both Diplom-Ingenieurs too, but they were lieutenants in the air force, and they didn't care if I as a private was ahead of them. But that happened in Peenemünde a few times, in a few cases. OK. I'm ahead of --

NEUFELD: That's fine. I mean, I think you should tell it the way you want to tell it. But I'm just trying to keep sort of on track.

HEIMBURG: Yes, right.

NEUFELD: You arrived in April approximately?

HEIMBURG: In April. I think it was April, yes. And I was on the first day in an office, and somebody came in, you may have heard the name Roth --

NEUFELD: --Ludwig Roth--

HEIMBURG: Ludwig Roth, yes, and he was the head of the project department. And we were two in that room, Hans Paul, you may have heard of him too.

NEUFELD: Hans Paul?

HEIMBURG: Hans Paul and I. And he interviewed us, and he took a liking to me because he came too from Darmstadt and Hans Paul came from a different school. So he accepted me for his office in the project department. This is the way how I came into the project department. So he had selected me.

NEUFELD: Just a question there. Seems like there were an awful lot of people from Darmstadt.

HEIMBURG: Yes.

NEUFELD: At Peenemünde. And Dresden. Those seem to be the -- there was also Stuttgart and some others, but Darmstadt, was there a sense of their being a club almost or like a connection strongly between Technische Hochschule Darmstadt people that you saw them all the time?

HEIMBURG: No, I think that whole thing was accidental. Especially on the guidance side. There was Steinhoff, and Steinhoff of course knew quite a few people of the Technische Hochschule

Darmstadt, so when he built up of course he tried to get people he knew, not unknown people but people he knew, and so there was Steinhoff, there was Neubert, there was Hoelzer and a few others that were even in the same fraternity. And Steinhoff tried to convince them, this is the way you should go.

NEUFELD: So it was a personal connection.

HEIMBURG: They had personal connections. But on my side, I had no personal connection. And in fact, there was nobody there whom I knew from my time at Darmstadt. And on the mechanical side, there were by far less people from Darmstadt as on the electrical side. On the electrical side there were quite a few.

NEUFELD: So you went to, you were first assigned to the project office under Ludwig Roth. How large an operation was that at the time?

HEIMBURG: Fifteen people. About fifteen.

NEUFELD: And your assignment was basically --I saw one organization chart for 1942 that shows that as directly responsible to von Braun.

HEIMBURG: That's right. That's right.

NEUFELD: When did you first encounter him? And what was your impression?

HEIMBURG: I encountered him after I had finished this design of the A-7, and Roth called von Braun, "I think you should see that," and von Braun saw that, and was immediately for it and said, "Yes, let's do it." Then he told me, "Would you be interested to take the whole project?" I said, "Yes, of course I would." So this is the first time I saw von Braun. And the second time, I don't know what the reason was that I saw him, but I complained to von Braun that you know, being accustomed from industry, you estimate a job and say it costs that much and then you have to stick to it. And at the same time you are asked, "How long does it take you?" And you had to stick to that time frame too, and there was usually under these contracts a sentence for each week of delayed delivery we are justified to deduct so much money from the total contract. When you have that as your education, I didn't like in Peenemünde that everything was under-estimated. But really knowingly under-estimated. And I complained to von Braun about it. He said, "Look, in our business, if you do not under-estimate the job, you have lost the job before you have it." And I learned this was absolutely true. This was here in the States the same thing. You had to under-estimate. And I give you one example of that. In the Saturn I, maybe you have been told this story, how the Saturn I came

into being. You know at that time the Secretary of Defense Wilson who was formerly the head of General Motors, he came to Huntsville and talked to von Braun that the Russians had come out with a new motor, a big motor, and von Braun explained to him, to build a new motor takes six years. And Wilson didn't like that at all. He told him, "Look, you are here in the United States. In Europe that may take six years, in United States only four." And von Braun immediately pressed that idea, what he was after, and he then proposed to Wilson, "Look, we can cluster the vehicle with an engine we have." You know we had clustered on the A-4 motor 18 small motors too. This was how the A-4 motor was really created. V. Braun must have thought about that. He said, "OK, if we cluster eight of those motors, and we can do the same thing with the tanks, and then we can start manufacturing tomorrow." And Wilson liked that idea, "OK." About two weeks, three weeks later the first commission came, to Huntsville, and they had I believe 12 million dollars, and I asked von Braun, "What can I ask for the test stand?" And he said, "Well, I have no idea. You have to feel your way." OK, I was the last one to be asked, how much would your test stand cost? And there was hardly any money left. So I said, "\$75,000." And about six weeks later or eight weeks later the same commission came back, meanwhile they had 45 million, and the money was redistributed again. Then I was the last one to be asked, "Karl, how much did you say your test stand is costing?" I said, "\$750,000." You could have heard a needle drop. And somebody asked, "Didn't you say \$75,000?" I said, "Yes, I did, but at that time we were still in the foundation, now we are above ground." Everybody laughed. No criticism. It was accepted. The test stand cost in the final end 2.4 million. I knew that, but if I had said at that time 2.4 million, I could eventually have killed the whole project. That was what von Braun had told me already in Peenemünde, be careful. If you come out with true figures, you have lost the project before you have it.

NEUFELD: So the under-estimation at Peenemünde, you're talking about internal estimates.

HEIMBURG: Internal estimates.

NEUFELD: Not what companies might estimate that it would cost to deliver them.

HEIMBURG: That's a different story. That's internal, internal when you had to sell a project, as in the case, you wanted to sell a project and you didn't want to kill it.

NEUFELD: Now, your first impression of von Braun, I guess I wanted to get the month that you finished this A-7 and first met von Braun. Roughly.

HEIMBURG: Roughly that must have been let's say May, 1942.

NEUFELD: So you came and that was just in a month or so you had completed the A-7.

HEIMBURG: Yes. Later, yes.

NEUFELD: And you met von Braun and what was your impression of him as a personality? If it's possible to separate your later reaction from the way you first saw him and how he struck you.

HEIMBURG: This is in retrospect for me very difficult to say. I knew he was the boss. I knew he was younger than I was. And I was surprised, that a young man was put in that position. And of course, in my thinking, I thought well, wait and see, how does it turn out, how would that be in the long run? So let's say I was in a waiting position, not distrustful at all but, you know, just wanting to know, how does it turn out, how does it work?

NEUFELD: Well, I think that's important that you say something like that, because we need all kinds of pictures of reactions to him. Everybody says he's wonderful from the first time they met him. You know, he was a very young person for that responsibility.

HEIMBURG: He was very young, right. And in industry, you do not find people in that age in the top position.

NEUFELD: 30 in 1942, he was.

HEIMBURG: Yes, right. Right.

NEUFELD: OK, so you worked with Ludwig Roth--

HEIMBURG: With Ludwig Roth.

NEUFELD: Can you describe him? Because I haven't encountered anybody who worked with him, and how the project office worked.

HEIMBURG: When I made this design, you know, I was asked to --OK, we want to know the weight, and I, as I was accustomed from industry, I put down the weight as I saw it, and underneath as a last one, unforeseen like bolts and nuts, 15 percent. When Roth saw that, he was white. "How the hell can you do that? We in the aircraft industry, we know each crank. You cannot say, 15 percent for bolts and nuts and unforeseen. You have to calculate that accurately. Would you please do that again?" "OK," so I sat down and took each detail, and added the 15 percent in all the details, and then I came back with the same figure but nothing unknown. And he said, "See, this is how this is done in the aircraft industry." OK, now, you should not characterize Roth only with that story, that would be dead wrong too. This only was

my first experience with him. He was, I'd say, pedantic. I believe that would be the best expression. But I want to come out positive with that. In the job of building rocketry, you had to have people who were really outgoing into the details, in the last detail. By the way, that's Hoelzer too. He went into the last detail. And that was once in a while, you could despair, because he didn't give a damn about time--if this was in the evening at 10 o'clock or it was at night at 2 o'clock, he insisted on the details. And definitely I have to say, you have to have these people. They are a necessity. Therefore it would be wrong if I come out and say he is going out in too much detail. This is a necessity. You have to have people like this. And we had quite a few.

NEUFELD: So this was Roth.

HEIMBURG: Roth went into the details too. And you know, he came out from Darmstadt, and he was in the glider business, and of course, they are two -- in the beginning, you make quite a few mistakes. And by these mistakes you learn how careful you have to be. So when you were working, and you are constantly, let's say, you have the feeling you are dealing with details which come later, where you personally have the idea, this is later, this is not now, this is later --you would say, no, this is now. But you know, this is a criticism which I accept. One works this way, the other one works this way. And since he is your boss at that time, what he is saying is valid, not what you are thinking.

NEUFELD: So you would say that you had some problems in working with Roth, but that there were many advantages --there were some advantages to the way he did things.

HEIMBURG: And I would say the advantage definitely better than the disadvantage. Definitely so. Only when you are working, you know, you feel--

NEUFELD: --a little uncomfortable.

HEIMBURG: A little uncomfortable.

NEUFELD: So the project office was basically assigned to advance design of the future projects.

HEIMBURG: Future projects.

NEUFELD: That were still on the drawing boards.

HEIMBURG: That's right. That's right. So for example, I went to test organization, and Roth wanted to have me back in the moment when that anti-aircraft rocket came up, and the people in test were stronger than Roth so I stayed at test. But he definitely

wanted to have me for the design of that Waterfall project.

NEUFELD: So were you involved at all in, or did you know much about, the design of A-9, A-10, the idea of an intercontinental range missile, or did you have nothing to do with that?

HEIMBURG: I could tell you a story of A-9. The first A-9 was to be launched, and I was in test lab at that time, and the A-9 was to be launched close to one of the test stands. The test stand was of concrete design. They had 3 meter concrete roofs, and under this roof you had your control station. I didn't trust the A-9, that was my feeling, and we were standing on the roof. There were about 20 people, and I was standing in the back with two other co-workers. And all of a sudden there was a call, "Heimburg, you are afraid!" I said, "I am. I only want to tell you, in case something goes wrong, where I stand, there goes a staircase down, and when you go one story down, there's a door, and you are in a safe place under three meters of concrete." They all laughed. So the first A-9 was launched.

NEUFELD: The first winged A-4?

HEIMBURG: And all of a sudden, it stopped in the air. At that moment, we three ran down, went into that shelter, closed the door. There was a big explosion. We opened the door, ran up, and there you would see the 11 people flat with their faces on the ground. I said, "See? You could have had that easier." That was the A-9. The launch of the first one.

NEUFELD: Yes. That would have been late '44.

HEIMBURG: Late '44, right.

NEUFELD: When you were at projects office, did you know much about --had that design been done already? Not just the winged A-9 but I mean, the whole huge first stage idea, the A-10, the two stage vehicle? Which never got off the drawing board.

HEIMBURG: Right. Right. I knew the A-10, and the ideas about the A-10, and the A-9 was cancelled at that time when I worked on the A-7 with wings. And that was only let's say under cover, was the further work, and later on it came out again. You know, that --against the end of the war there was a saying, what could we do to bind American forces? And Steinhoff had a brother who was a submarine commander, and the two had the idea, why don't we put an A-4 in a boat which is behind the normal submarine but underwater and then we go before New York City or before Washington and launch it from there? And that project was at the end of the war almost completed. You know, the boat was built and we had tried out the system so that it would work, but this was at the end of the war. Since the A-9 didn't come forward, the

idea with the A-4, which was a complete vehicle by that time, was an easier affair.

NEUFELD: I should come back to that then. You were involved then in that whole Schwimmweste --

HEIMBURG: Schwimmweste, yes.

NEUFELD: -- project for a canister launcher.

HEIMBURG: Well, the Schwimmweste, that was at the time when the Russians were already coming pretty close to Peenemünde, and the question was asked, well, we are not through with the development of the anti-aircraft vehicle, what can we do, where can we go to test it? And then came the idea, since we do not know where to test it, why don't we take a barge and build the test stand on top of the barge, and then we can decide later on where to test it? So this was again at the end of the war too, that we designed the Schwimmweste, which was a floating test stand for an anti-aircraft vehicle.

NEUFELD: So Schwimmweste became, Schwimmweste was not the U-boat project? It was the floating test stand?

HEIMBURG: This was the floating test stand. Where you could take the anti-aircraft--we had built at Peenemünde, and I was in charge of that, when that came up, that project, OK, you are in charge for the test stands. We built the test stands, which I think --I built a test stand first for a combustion chamber and then for the complete vehicle.

NEUFELD: Wasserfall.

HEIMBURG: Wasserfall.

TAPE 2, SIDE 1

NEUFELD: Now, you designed the A-7, ground launched version of the A-7, which was a winged A-5, is that correct?

HEIMBURG: That's right.

NEUFELD: Then you completed that, and was that cancelled then immediately afterwards, or how far did you get with it?

HEIMBURG: We had the first vehicle on the test stand when that project was cancelled. And as I was told at that time, we cannot realize that project because it takes years until you could have the total vehicle and the war will not last that long. This was what I had been told at that time.

NEUFELD: How long after this design was finished in May '42 was that? Later in 1942, some months later?

HEIMBURG: I would guess, August, September, 1942.

NEUFELD: There were some airplane drops of unpowered, is that true?

HEIMBURG: This is correct.

NEUFELD: Of unpowered A-7 models.

HEIMBURG: Unpowered A-7 launches, yes.

NEUFELD: You say there were three versions, one where you were going to drop powered from an airplane. Did you ever do that?

HEIMBURG: No. No, that was not done.

NEUFELD: So there was just a gliding test.

HEIMBURG: Right.

NEUFELD: And then the project was just suddenly stopped.

HEIMBURG: Yes.

NEUFELD: In about August or September 1942.

HEIMBURG: By the way, have you heard ever the name of Dahm?

NEUFELD: I don't think so. I'm not sure but I don't think so.

HEIMBURG: He was in the project department, and he eventually could give you more detailed information about that, because he stayed there, while I went out of the project department.

NEUFELD: He lives in Huntsville?

HEIMBURG: He lives in Huntsville, yes.

NEUFELD: OK, I'll keep that in mind. Did the project department then continue as a smaller operation after that time?

HEIMBURG: No, that stayed exactly the same way. Only I had left. Because at that time I didn't have a job, and I asked Roth, what should I do now? And he told me, "Look, why don't you keep your self busy until a new project comes in?" And I personally didn't like that too well. That was the reason that I looked for a different job, and went into the test department, Versuchs

department, Versuchsabteilung.

NEUFELD: Versuchsabteilung.

HEIMBURG: Yes.

NEUFELD: Which was headed by Thiel, right?

HEIMBURG: Yes, by Thiel, Dr. Thiel.

NEUFELD: And whom were you under directly in terms of your immediate supervisor?

HEIMBURG: I was directly under Hueter. Hans Hueter.

NEUFELD: And what were your responsibilities then when you started with the test stand?

HEIMBURG: I was put on the test stand, and had to record all the difficulties which came up in the preparation of the test and during the test itself. I should tell you something about the test. As we said at that time, if the test failed and you didn't know what happened, that was a complete failure. And if you did know what happened, then you would say, that was a successful failure. And in order to trace the whole thing, we had instrumentation, so that you could say, until here everything was fine, from here on, OK, what happened now? And you started out with less instrumentation and added more and more during the time of testing strictly on account of the experience which you gained.

NEUFELD: You were --were you assigned to Test Stand 1 for static engine tests of A-4?

HEIMBURG: No, that was 7, Test Stand number 7.

NEUFELD: So 7, in addition to being the main launch area, was also a static test area.

HEIMBURG: I was down in southern Germany because that plan didn't --

NEUFELD: --at Lehesten.

HEIMBURG: No, close to, not too far from Salzburg. And Oberth's daughter worked there too. And I was sent once in order to help out, OK. That I can give you later on in detail if you're interested. But anyhow, that plant was in lousy operating condition. One day there was an explosion, and Oberth's daughter was killed in that explosion, and von Braun told me, "Look, take a car, get over to the funeral." Oberth was working in the middle

of Germany at that time, so we left Peenemünde early in the morning, got over in the middle of Germany. When I told Oberth, "Your daughter was killed," he said, "Well, can I get my wife from Feucht (near Nuremberg)?" I said, "Sure," so we drove to Feucht, and his wife and daughter came along in that truck, and we came to Munich. That was midnight. And Munich was absolutely dark.

NEUFELD: This was about 1943?

HEIMBURG: That was 1944.

NEUFELD: '44.

HEIMBURG: '44. The question was, how do you come through Munich to the Autobahn on the other side? And Oberth, that's the reason why I tell you that story, said, "Let me go out on the dashboard," and he directed the driver according to the stars through Munich, and we came to the Autobahn without any difficulty, strictly by the stars. OK, that was the story I wanted to tell you.

NEUFELD: About Oberth. While we're on the subject of Oberth, did you meet him in 1942, '43? At Peenemünde?

HEIMBURG: I did not meet him at Peenemünde. That was the first time I met him officially, when his daughter was killed. And he was not working at that time at Peenemünde. He was working in the middle of Germany, somewhere, on a solid rocket.

NEUFELD: I gather he was not happy with his job at Peenemünde.

HEIMBURG: No.

NEUFELD: And went to find a solid propellant job.

HEIMBURG: No, not at all, and maybe I give you an explanation, which explains Oberth. You know, Oberth was absolutely convinced of himself, and in designing the injector for the rockets, you know we had enormous difficulties, and we finally succeeded against the end of the war with an injector plate which didn't explode after two or three seconds, and Oberth didn't understand that. And they were trying to explain to him, we need to have finer holes, smaller holes than we have, but we do not have drills to drill the finer holes. And then he said, "OK, let's develop the finer drill." You could not convince him that with a drill, you can go only to a certain dimension and later on it doesn't function any more. "No, that's a matter of development, you can develop that." You could never convince him. And this was a difficulty, let's say, on the side of the development. No matter what problem came up, you could solve that.

NEUFELD: He had very little practical experience.

HEIMBURG: This is exactly it, he didn't have practical experience. That does not deduct from Oberth at all when I say that. Oberth still was the man who really was the pioneer, THE pioneer, something which wasn't heard of, and this is the difficulty which von Braun had with him. He could not convince him, this or this you cannot do.

NEUFELD: Yes, I read a biography in Germany that was written about Oberth, and I met the man who wrote it at Oberth's house, in the museum at Feucht, and you get the impression from that that Oberth felt that somehow, von Braun had, at one time --

HEIMBURG:--had pushed him aside.

NEUFELD:--had pushed him aside, yes, which isn't true. But I think later on in the United States period, von Braun made a big effort to try to mollify Oberth, you know, show him respect for that. But Oberth arrived in Peenemünde and criticized everything and didn't know much about what was really going on.

HEIMBURG: You know, after von Braun had heard that Oberth was not well off at first after the war, he got him here. That was von Braun who got him here, strictly so that he would have an income, which he didn't have in Feucht. So he was here for a number of years, I don't know how long.

NEUFELD: Two or three years in the late fifties.

HEIMBURG: Yes, right. Von Braun was the one who did that.

NEUFELD: It's a good place to ask you something that I'd forgotten to ask you, which is, did you remember, did you know anything about the rocketry and space flight business before this time? Had you paid much attention to what was going on in the late twenties?

HEIMBURG: None whatsoever. None whatsoever. The first time I heard about Oberth was when I arrived in Peenemünde.

NEUFELD: This was about the time, 1928, '29, about the time you started at the Technische Hochschule, you just sort of ignored the business about Max Valier's rocket?

HEIMBURG: Right. I didn't know about that.

NEUFELD: Did you note that it was in the papers and just ignored it?

HEIMBURG: No.

NEUFELD: You didn't even pay any attention.

HEIMBURG: I didn't pay any attention to that.

NEUFELD: So when you came to Peenemünde then, did the whole thing strike you as really unusual, radical, different?

HEIMBURG: Definitely, unusual and radical, and therefore your interest was immediately in it. And you could see, too, you had enormous possibilities around for that, for space flight, and you let your thoughts spin about that, too.

NEUFELD: Did anyone talk to you about space flight? Did you discuss it privately at that time?

HEIMBURG: We did that privately. You know, we had the company, and under each other, there were some who were a little bit more interested, but what else can you do with it?

NEUFELD: Did the projects office discuss satellite projects at all or just, not when you were there anyway?

HEIMBURG: We did not discuss it officially. But under each other, we had discussions. But always with the same idea: let's solve our problems which we have right now first.

NEUFELD: This is very abstract, when people are pressing you, do this, do that.

HEIMBURG: Yes.

NEUFELD: Before I return to test stands I want to ask you, a lot of people have spoken about a particular special atmosphere at Peenemünde, in terms of the attitude of people and so forth. Did you see that, that it was an unusual organization or unusually fertile area, that people were extremely enthusiastic about what they were doing?

HEIMBURG: No. Definitely not, in a generalization. Definitely you had people who had a high interest. But generally, you could not generalize that.

NEUFELD: For a lot of people, it was a job.

HEIMBURG: For a lot of people it was a job. Right.

NEUFELD: When you arrived there were already a number, thousands.

HEIMBURG: You are right, there were several thousands at

Peenemünde.

NEUFELD: OK. Now, to return to the --

HEIMBURG: --this is a question you could ask Tessmann or Rudolph. Where in that area, since, as Tessmann, 1934, and who had --he said when he arrived, he had several conversations where von Braun told him about space flight and they could only shake their heads, because that was completely new to them, and they were, as Tessmann at that time, were very young engineers just coming out of college.

NEUFELD: I would definitely like to use your name to ask him if he would like to interview, because people who were there earlier are very interesting people.

HEIMBURG: If you would come this afternoon, I could ask him to come over, and I tell you why. Tessmann had a heart operation, four bypasses. I told you the story about Oberth in Munich.

NEUFELD: Yes, right.

HEIMBURG: That was strictly a sideline.

NEUFELD: OK. So we were just beginning, I think, before we got sidetracked, a couple of, some interesting stories, we were just beginning to talk about your time at test stands.

HEIMBURG: Right.

NEUFELD: And you said that you were directly under Hueter.

HEIMBURG: Hueter.

NEUFELD: And you were not on the A-4 engine test stand at that time, were you? Or were you in all different kinds of tests for different engines and vehicles?

HEIMBURG: When we talk about the first months on the test facility, it was strictly on test stand number 7, and test stand number 7 had carriers for the rocket. We had an Assembly Hall where the vehicle came in, and was put into that carrier, and in that carrier, we went to Spritzpruefstand, as we called it at that time. That was strictly a calibration test stand, where you checked your mixture ratios in the pumps, and corrected it, so you used oxygen and alcohol but you caught it again and found out if your mixture ratio was correct before you went and, let me say, the hot test stand. Let me express it this way: the test was run like a normal combustion test, only a match was not used.

NEUFELD: Did you run the fuel and oxidizer through the system and

then out onto the floor or how?

HEIMBURG: No, into tanks. Into tanks.

NEUFELD: Into the tanks.

HEIMBURG: It was in that, let me say, car or structure on wheels. There was a rocket, and there was a ditch, and in that ditch you moved ahead and then you moved it to the side on that spray test stand, and we had two spray tests stands or let me say calibration test stands, is a better explanation. And only after we had the proper mixture ratio, then it was brought on the hot test stand. I will have to tell you something. The combustion chamber had to be calibrated before the assembly in the missile. On account of the design and manufacturing, there were enormous differences in the pressure drop from chamber to chamber between two and six atmospheres. Accordingly, you had to throttle your oxidizer according to how much fuel the combustion chamber would use per second.

NEUFELD: So this --

HEIMBURG: So it was actually a calibration stand for the combustion chamber. Now, you had differences in the pumps too. One pump was stronger and the other one was weaker. And this is the reason that you had, after you had already calibrated the combustion chamber, you had to go on that calibration test stand with pumps and turbines. Until you were sure you had the proper mixture ratio. In the beginning, until we came to that solution, we had lots of failures, where the combustion chamber burned through because the mixture ratio was oxygen-rich.

NEUFELD: Let me just ask you one detail question. The pressure drop you mean is the pressure drop from the pipeline into the combustion chamber, the injectors?

HEIMBURG: Within the combustion chamber.

NEUFELD: Right, so the variation was due to variations in the manufacture of the injector design?

HEIMBURG: You have to see the combustion chamber of the A-4. The design of the A-4 combustion chamber was a compromise since we did not in time succeed with a single injector plate. We used the design of a successful 1.4 to combustion chamber and put it 18 times of the A-4 combustion chamber. $18 \times 1.4 = 25$ to the 18 combustion chamber caused the pressure drop differences.

NEUFELD: The pressure differences were produced by differing injectors, quality of the injectors or design of the injectors?

HEIMBURG: Since it was hand made, and it was strictly a welding structure, you could not keep your dimensions, as it was on the paper.

NEUFELD: Ah, so it was the dimensional --

HEIMBURG: It was a dimensional problem.

NEUFELD: So just in terms of the size of the combustion chamber, the size of the nozzle--

HEIMBURG: Right.

NEUFELD: The area of the throat and so forth, you had variations significant enough to make big differences.

HEIMBURG: Yes.

NEUFELD: And those are in the development made engines made inside Peenemünde that you had.

HEIMBURG: The combustion chambers were manufactured at Breslau. And this is where that occurred. But you couldn't help it, on account of the design. You know, in the moment when you would have had one injector plate that would have been by far simpler, and we tried it constantly, as I mentioned, two three seconds, one big explosion, and enormous vibration noise, so the injector plate was fluttering, and destroyed by that fluttering, until we finally succeeded, I couldn't even tell you why we finally, what the reason was we finally succeeded, and I don't believe that anyone is here left who could tell you. Lindenberg was responsible at that time for that design. But he died already while we were in El Paso.

NEUFELD: Yes, in fact, I had interviewed Mr. Dannenberg about some of these issues. Of course he too had left before Wasserfall which is where you finally solved the injector plate.

HEIMBURG: Yes.

NEUFELD: So I asked him about these various designs. There was one called the Ringspaltmischduese, which was Beck in Berlin, and then there was this Bohrungsmischduese which Lindenberg was involved in, and Dannenberg to some extent.

HEIMBURG: Yes.

NEUFELD: Do you remember much about those tests?

HEIMBURG: No. You know, I was strictly in the testing of the V-2, and when there were tests made on test stand number 1, with the

new methods, I was not directly involved, only indirectly, and knew about it and was of course interested, but you had so much to do with your own problems, in spite of your interest, that didn't help you a bit. You had your own problems.

NEUFELD: So you would have arrived at test stand 7 after the first attempt to launch failed in June, and probably after the second one failed too, but just before the third launch succeeded?

HEIMBURG: I was at the test stand already for the first launch, second launch and third.

NEUFELD: You saw them.

HEIMBURG: I saw them. Cut it off, I tell you a story. ...

NEUFELD: So you had seen the launches before.

HEIMBURG: I had seen the launches.

NEUFELD: Seen those launches before, but you arrived about the time that the first successful launch, the famous one on October 3, 1942.

HEIMBURG: At the time of the first failure, I was already at the test stand too.

NEUFELD: See, I was thinking you came in August, September '42.

HEIMBURG: Yes.

NEUFELD: And the first successful launch was October, '42.

HEIMBURG: Yes, right. I was at one failure before when I was already at the test site.

NEUFELD: That was in August, I think.

HEIMBURG: Yes.

NEUFELD: So that, you were not directly involved in the launching, were you?

HEIMBURG: No, I was not involved in the launch. I was involved in the testing, but not any more in the launch.

NEUFELD: Test stand 7 then had a dual purpose.

HEIMBURG: Test stand 7 had to prepare the vehicle, the testing on this calibration test stand, then for the test firing itself, and

then for the launch.

NEUFELD: Because now basically, other than the occasional static test on the launch pad, you don't have the test stand combined with the launch area itself. But, so you were working with complete vehicles essentially?

HEIMBURG: Yes, that's right.

NEUFELD: Not with engines.

HEIMBURG: Not with engines. That came later on. I was more involved with the problem through the mass production, where we had not only the test stands at Peenemünde but we had the test stands at Lehesten and we had a test stand in Austria in a brewery.

NEUFELD: What was the name? I think I've heard it.

HEIMBURG: In a brewery we had --

NEUFELD: How do you spell that?

HEIMBURG: It will come later on. Vorwerk Sued.

NEUFELD: Vorwerk Sued was the name of it, yes.

HEIMBURG: Vorwerk Sued--

HEIMBURG: And you know we had the brewery underground, and that was the ideal thing to prepare everything underground and then go out for the testing only. And you know, this was at that time already something which was done not under Peenemünde's auspices. This was prepared under the control of the SS, and there were people who had not the slightest idea what was going on who prepared that, and there were camps, regular camps built in, and we had a man there who was not of the special liking of his boss in Berlin, and one day von Braun got a call that he should take that man out, and Dr. Schilling, you may have heard the name, he was in charge of the testing under, Dr. Thiel, was told, OK, you go to Vorwerk Sued, Schlier. Schlier is another name for it. And so, they took that man out and another man came in. I had to stay there, and that man was a special friend of the top man in Berlin, and he was originally at Riga but the Russians came closer and therefore his friend needed a new job and he put him in that job, and he hadn't the slightest idea what was going on. I do not know if you are interested now in the details, what all was wrong on that test stand, which we tried to repair.

NEUFELD: Let me just ask this question: this is about what time, '44?

HEIMBURG: '44. You know, when they wanted to produce 800 V-2s per month, and I could only say, man, how in the hell do you want to do that? We had then just two test stands to calibrate it, and test in this way the combustion chambers, and you had this one test facility in Schlier, which was absolutely dangerous, and which you wanted to correct, but you could only correct if you didn't lose time in doing that, so that made it extremely difficult. And I had one master mechanic with me, and when I left, I told that new boss, I told him and a friend a master mechanic, "If you do not listen to him, when it is dangerous, he should leave." And there was the danger, and that man told him, "We have to close it down." And the new boss said, "OK, let's go out into it with our engineering personnel and check it, during a test." And that was the last test run. The control room exploded on account of alcohol leaks, and they all were killed, so the whole engineering staff of that test stand was killed. And then I got that telephone call, "You have to get Oberth from the middle of Germany," because his daughter was killed too in that test stand. OK --

NEUFELD: You were just assigned to go there for a short time?

HEIMBURG: For a short time.

NEUFELD: To look into that?

HEIMBURG: Right. And then we had a bomb raid at Peenemunde and one of our test stands was bombed out, and we took the whole crew of that test stand and put them into that test stand in Schlier, for the rebuilding after that explosion. That was just finished when the war ended.

NEUFELD: OK. I'll have to come back to that when I come to the end of the war in the chronology. So you came to test stand 7 in August 1942, approximately.

HEIMBURG: Yes.

NEUFELD: And you remained there for how long?

HEIMBURG: I remained there until at the end of 1942, when the development of the anti-aircraft rocket was started, and I was put in charge of building the test stands for this anti-aircraft rocket.

NEUFELD: What were the numbers of those test stands?

HEIMBURG: We had one test stand for combustion chamber only, and one test stand for the complete vehicle.

NEUFELD: This is probably located elsewhere, but what were the numbers of those test stands? You know, you had test stand 7 for A-4. What were those called, do you remember at all?

HEIMBURG: We had test stand 8 for A-4 combustion chambers only, test stand 1 for new developments on the A-4, test stand 7 for the normal testing of the A-4. We had test stand number 5 for testing of pumps, the pump test stand. We had test stand number 2 for small engines. And I cannot even tell you what they were used for. That was before my time. And --

NEUFELD: --and Wasserfall was put on?

HEIMBURG: On that new test stand, which I, that was close to test stand number 5, the pump test stand, and it was inconvenient, let me say inconvenient, in that the exhaust gas was poisonous. You know, you had H₂SO₄ as an oxidizer, nitric acid,

NEUFELD: Oh, it was nitric acid, HNO₃, I think.

HEIMBURG: H₂SO₄.

NEUFELD: That's sulfuric acid.

HEIMBURG: Oh yes, you are right, HNO₃, and we had then oil, and the whole thing was hyperbolic, that is, if you put both together it ignites on its own. The exhaust gas is poisonous. So we built channels outside into the sea in order to avoid that people would come in the clouds of the exhaust gas.

NEUFELD: You mean that the pipes were led under the surface of the water?

HEIMBURG: A concrete duct above ground.

NEUFELD: Out to the edge of the water?

HEIMBURG: Yes, right, out to the edge of the water.

NEUFELD: Did you have any problems with the functioning of that system? Leakage of?

HEIMBURG: Not serious problems. After you were through with the A-4, you had quite some knowledge on what you had to watch out for, and since the temperatures were normal, it was not so difficult, as you didn't have problems with the valves, fuel or oxidizer valves, but you had an acid. This is what you knew and what you had to use special materials, special metals, in order to avoid corrosion, which could give you a problem, and you had some problem with the gaskets in the beginning, until you had a gasket which was really safe for a longer period of time for the

acid.

NEUFELD: So when you arrived, was there a test stand that had been started, or you started it with nothing and built this Wasserfall engine test stand?

HEIMBURG: No, there were already tests made in a considerably smaller scale. And that was done on test stand number 3. So that there was some information available, not a big information, that was on small scale, you might say, on a modest scale, was it tried out.

NEUFELD: Thiel --I've heard of this a little bit, I don't know much about it. I know that Thiel had been working with the idea of what was called by you Salbei --

HEIMBURG: Salbei, code word for nitric acid.

NEUFELD: And Visol, a hydrocarbon fuel combination. He had tried that out?

HEIMBURG: Yes, you are right. He was interested in that, and it was clear that, you know, you had a smaller exhaust velocity, and therefore your vehicle would become heavier when you used it. But for a purpose of anti-aircraft, or let me even say it in a different way, for military purposes, you are by far better off when you are working, when you do not have to work with a match to ignite it, when it goes automatic, or if you work with solids, solid propellant rockets. For military purposes this is a lot better. It is by far better, because when you have liquid oxygen and you have to refill constantly because it evaporates, this makes it difficult for troops who come from all sides of life, and they have difficulties to train them for those purposes. So in this respect, you know, the nitric acid and Visol were simpler, considerably simpler to handle.

NEUFELD: In spite of the corrosive and dangerous aspects of nitric acid.

HEIMBURG: Right, in spite of that.

NEUFELD: Now, Wasserfall is something that we have little information on. And one of my tasks will be to try to understand much more about what happened to it. I don't even have a clear idea of when it started. There are even conflicting dates, the conflict between --they in part come from, when the project was first put forward and when it was officially approved by the air force and so forth. What do you remember about when it started?

HEIMBURG: I could tell you, only you probably are best off to ask who was in the project office at that time, so he must have been

one of the first to get notified, to talk about it and to come out with proper decisions, how would we do it, because we in test, we heard about it only after it was already clear, it would have this form, this formation. When we were asked or heard about it, we didn't hear that that was accidental. I mean, Thiel probably knew about it. I don't believe that Hueter or Schilling knew about it. But Thiel may have heard about it, you know, in conversations with von Braun. And von Braun didn't discuss it with us because we had different problems. But they eventually could give you some information.

NEUFELD: Good. But as far as you recall, in the project office before you left, there was no Wasserfall.

HEIMBURG: There was no Wasserfall.

NEUFELD: At that level, you had never been told that there had been any discussion.

HEIMBURG: No. I would have heard it, because there were only 15 people, and if something of that nature would have come up, I would have heard it.

NEUFELD: So at some time late in '42, before you had started with the Wasserfall, you heard that this project was starting.

HEIMBURG: Yes.

NEUFELD: And then you were assigned to build up a test stand.

HEIMBURG: Test stand for it.

NEUFELD: At that point, you knew approximately what thrust engines you were dealing with?

HEIMBURG: I knew the dimensions. I knew the thrust. I knew the fuel amounts per second. So all this I knew at that time when I started the design, or when we started the design.

NEUFELD: So you started with this new Wasserfall test stand at zero essentially, that is, you had to plan it on the drawing board.

HEIMBURG: On the drawing board. Right.

NEUFELD: Did your experience in the chemical industry in Japan help you in your designing?

HEIMBURG: Oh yes, that helped me. That helped me, working with chemicals.

NEUFELD: Because obviously, I mean, that's, until you get to the engine itself, that's fundamentally what you're dealing with here, is chemical piping and valves and controls and everything else.

HEIMBURG: I believe this was even the reason that they selected me to do that.

NEUFELD: And so right at the end of 1942, some time, you started designing that test stand, and did you have many dealings with Luftwaffe people at that point? Was that a presence?

HEIMBURG: I mentioned that there were two lieutenants with whom I worked. One was Haase, and the other was Scheufelen, and Scheufelen had a paper plant in Germany, in southern Germany, and he was in charge of the test stand, when it went into operation, at that time, and Scheufelen --that may interest you--he had another idea. He built small rockets, tiny rockets, and launched them in a cluster, so the idea was, if I have --that was the same size as the 88 grenade, and if I launched 20 of them at the same time, it's easier for me to hit the plane. Instead of one heavy rocket where you definitely will get that one plane but this is an enormous expense. If I can do that with smaller rockets, even if I use twenty, it's by far cheaper. So he started with that program. You may have heard about that.

NEUFELD: What became Taifun?

HEIMBURG: Taifun, yes. That was Taifun.

NEUFELD: When did he first talk about that idea, 1943 or later?

HEIMBURG: '43. He came on the idea.

NEUFELD: So these are the two Luftwaffe people who were responsible or were assigned to the test stand.

HEIMBURG: Yes, they were assigned to the test stand. Haase was assigned by the Luftwaffe to make sure that the test stand went ahead, you know. He checked me constantly and I checked him. But we had a good understanding together.

TAPE 2, SIDE 2

NEUFELD: I was going to ask you whether you felt there was any Luftwaffe-army rivalry, tension involved in this, it was a collaborative venture between Luftwaffe and army, Wasserfall?

HEIMBURG: I had the impression that worked out very well, that there were no rivalries. As far as I could see it or as far as I

could judge it, there were no rivalries.

NEUFELD: This is of interest in part because there were certainly rivalries at the very top over V-1 versus V-2, as they were later called.

HEIMBURG: Right.

NEUFELD: Or A-4 versus Fi103, that there was infighting and so forth at the level of Milch and at the top.

HEIMBURG: At the top level, that may be so.

NEUFELD: Your own perception throughout, in terms of relations of Luftwaffe, Peenemünde-West, or with Luftwaffe assigned to Peenemünde-Ost, in Wasserfall and so forth, was a very good relationship.

HEIMBURG: I do not know if Rudolph told you that story, that von Braun didn't get the money to build up the facility for a military project, and that he, Dornberger, organized the air force to pay for that project Peenemünde because he couldn't get that money from the army. The air force paid for that, and they only finally made a fence, here is West, that's air force, and here is East, this is army.

NEUFELD: Right. Yes, certainly building Peenemünde was also a collaborative project.

HEIMBURG: That was, yes.

NEUFELD: You see, just from the highest level, you get the impression that the relationship was very good in the early years, '36 to '39, '40, and that there was then a bit of a deterioration which may have had no effect on the lower level at all. Namely, that the Luftwaffe dropped Starthilfe and dropped aircraft rockets and so forth, at Peenemünde Ost.

HEIMBURG: At Peenemünde, not that I know of.

NEUFELD: Those projects were sort of killed at the beginning of the war, and then Wasserfall came along as a collaborative project later on.

HEIMBURG: Later on.

NEUFELD: But from your side or from what people said, obviously you only came in 1942 so you can't say much about earlier periods, the relationship was always friendly, and there wasn't a sense of rivalry or something like that.

HEIMBURG: No. This again is a question you could ask Tessmann, because Tessmann was sent relatively early to Peenemünde for planning purposes.

NEUFELD: So from what you were saying, it sounds like you were responsible for construction of that test stand for Wasserfall.

HEIMBURG: That is right, yes.

NEUFELD: And then you were moved on to some other job after that?

HEIMBURG: Ja, then came the mass production of the A-4, and you know, we had only that one test stand at Peenemünde for our combustion chambers, and we knew that one test stand was not enough, and there even, I cannot tell you what was planned, at Wiener Neustadt, you may have heard that word, but I don't believe that test stands were planned there. But again, Tessmann could tell you, because he was sent out to find out where are possibilities, and I believe Tessmann was even involved with Lehesten. This Lehesten was a slate quarry, and you had perpendicular walls. You could say it's ideal for test stands. You do not need a jet deflector. With a jet deflector you need water. So if you would have a perpendicular wall, you put your test stand on top, you would not need a deflector. Therefore that was built at Lehesten, and then it was decided, it is still not sufficient, we need more, and then came that Schlier project.

NEUFELD: And Schlier was where in Austria?

HEIMBURG: That was on the watershed.

NEUFELD: Was it in --?

HEIMBURG: Ask me that question again, this afternoon, afterwards, to look it up at the map.

NEUFELD: But you think it's more in western Alpine part of Austria, Tyrol?

HEIMBURG: No, no, it was more to the --

NEUFELD: --to the east?

HEIMBURG: It was more to the Bavarian side.

NEUFELD: Close to Bavaria.

HEIMBURG: Close to Bavaria. It was not far. Well, I take a look at the map this afternoon, I can show you.

NEUFELD: OK.

HEIMBURG: If you have not thought about that for 20 years!

NEUFELD: I test people's memories a lot, I keep pushing. I understand you can't remember these things sometimes. But immediately after you completed the design and the construction of the Wasserfall test stand in early '43, in mid-'43?

HEIMBURG: This was already, yes, going in '43, I would see.

NEUFELD: End?

HEIMBURG: End '43.

NEUFELD: So you were involved most of 1943.

HEIMBURG: Yes.

NEUFELD: Building, designing and building.

HEIMBURG: Waterfall, a double test stand a combustion chamber test stand and one test stand for the waterfall missile

NEUFELD: Wasserfall test stand.

HEIMBURG: Yes. Yes.

NEUFELD: Was there a second Wasserfall test stand?

HEIMBURG: No.

NEUFELD: There was just the one.

HEIMBURG: And the Schwimmweste. The Schwimmweste was strictly build in case Peenemünde is occupied by the Russians, we can still test the Waterfall on a floating test stand.

NEUFELD: That was a 1944 project?

HEIMBURG: That was 1944.

NEUFELD: That came up late in '44?

HEIMBURG: I believe in the middle of '44.

NEUFELD: So were you mostly working with Luftwaffe people? When you were building that test stand? Or was it a mixture?

HEIMBURG: Oh, yes, of course, the normal Peenemünde people were involved too, on the building side there, so you could not say it was only air force people. There were Peenemünde people, army Peenemünde people involved too.

NEUFELD: This is a question I'd never thought about before. Who was the construction labor force in building the test stands? I mean, I know that there were prisoners of war used there. I don't know where they were used.

HEIMBURG: There were prisoners used, and I just give you an example. I was interested, how the people come in this uniform, and we were supposed not to talk with them, but I was interested and I asked one, how in the hell did you come in that uniform? They said, "Oh, that's very simple. At the beginning of the war, I smuggled coffee from the Netherlands, into Germany, and they caught me." I had to ask a second one, what was --he had a smuggling affair too where he was caught. This is a normal affair, there's nothing special, if they commit something against the prescription, they will be punished. These were in the building groups you had. They worked with prisoners.

NEUFELD: Did they wear the concentration camp prisoner uniform?

HEIMBURG: No.

NEUFELD: From the ones you knew, they were largely, they weren't political prisoners, they were largely ordinary prisoners?

HEIMBURG: They were ordinary prisoners. They were ordinary prisoners.

NEUFELD: I've heard of this --

HEIMBURG: Something that may be interesting to you too is when I was at Lehesten, they were there prisoners too, and the prisoners got cigarettes. You know, we had six (women three) cigarettes a day, and the prisoners got cigarettes too, but somehow, you could buy cigarettes from the prisoners. How they did it, I do not know. Probably the prisoners got cigarettes and they didn't go to the prisoners, but they were smuggled out before. This is what I assume.

NEUFELD: The POW labor force that was used, was that used elsewhere? There are almost no details. I know that Russian and Polish prisoners of war, there was a camp and they were used for construction purposes, I think.

HEIMBURG: Yes. Generally they were used for construction problems, and I believe even there were Polish people involved, because some information which I heard later on from the British side, the information they got from Polish prisoners, about Peenemünde.

NEUFELD: Yes, I know that some information was smuggled out.

HEIMBURG: And I have even seen papers here where they had drawn maps, and you could see, these were people only who came from the construction site. But they showed the test stand exactly, very exactly, but not in the final stage where you had in your containers and your --it was strictly construction drawings, or construction sketches. And these papers came from the British side, and the British said, "Well, this came from Polish prisoners."

NEUFELD: So the test stand was constructed, and you were totally involved with that activity for 1943. On a daily basis you were completely busy, I assume.

HEIMBURG: Yes.

NEUFELD: Just working on it, trying to, on the various problems involved in working out the construction of it.

HEIMBURG: That's right, until it was put in operation and functioned. Then this was the end of my work at that Wasserfall. But you had still problems. I give you one. You know, the idea was to launch the V-2 from France, and they had built a big concrete shelter over there, were trying to build a big concrete shelter in France, and every time concrete was poured, the British came and bombed it. So all of a sudden, we got the task, we have to make the V-2 mobile. And then came the design of the launch table, and the trying out of the table, and the trying out of the vehicle, which carried the V-2 either by train or on the street.

NEUFELD: Yes, the road mobile unit.

HEIMBURG: The road mobile.

NEUFELD: When do you recall that road stuff started?

HEIMBURG: I think that was in '43. But I take that out of the air.

NEUFELD: It wasn't your area?

HEIMBURG: It wasn't my area.

NEUFELD: So then the train experiments, the train launch experiments were in '43, I think. Couldn't be any earlier.

HEIMBURG: I think that was in '43, end of '43.

NEUFELD: Do you remember, do you know anything about why the bunker approach was taken?

HEIMBURG: In the beginning?

NEUFELD: Yes, in the beginning.

HEIMBURG: The idea was you have, in the bunker, you have your oxygen plants, and you have no transportation problem with the oxygen because you manufacture it right there. This was the reason. And you know, I had mentioned Lehesten. Lehesten had 16 oxygen plants underground, with a production of 500 kilograms of oxygen per plant, so 16 times is eight metric tons per hour, and against, in the last months of the war, the production for the V-2s came from Lehesten by rail, the oxygen plants.

NEUFELD: Lehesten was near the Mittelwerk, in the same general--

HEIMBURG: --it was in Thuringen.

NEUFELD: Yes, it was in Thuringen.

HEIMBURG: And it was a slate plant originally.

NEUFELD: The bunker idea, did the bunker idea have support in part because it was felt early on, and again this may be too far from your area, but do you know anything about why, the difficulties in launching such a complicated vehicle led to that, did that cause people to say, we need an underground test area?

HEIMBURG: You know, you could prepare the vehicle completely underground, fill it and prepare it for launch completely, and then roll it out and launch it. So you couldn't be disturbed when you were outside. And later on, after the whole thing was made mobile, you know, they went into the forests, and in the forests they could not launch more than I believe eight or so, because then you could detect it from the air, because the leaves were burned. So they launched up to eight out of the forest, and then they went to the next position. But you still had, fuel and oxidizer had to come right after, so that was still quite some transportation necessary.

NEUFELD: I gather though that the road mobile thing worked very well. That it was very successful.

HEIMBURG: It worked better than we originally thought.

NEUFELD: The reason I'm pursuing this is, I get the impression, and this may be wrong, that at the earlier stage, that von Braun and others maybe felt that you needed an underground checkout facility, more like a test stand, for such a difficult vehicle, as opposed to giving it over to military units, you know, where most of the people did not have, would not have any particular

expertise in this, just the training in their job. And I don't know whether that's true or not.

HEIMBURG: You know, we had the troops on the test stand and trained them on the test stand, and the soldiers we had were technical people. So to train them was not a difficult problem. It didn't take long. So I don't believe that at least from my viewpoint, you would have thought that would be difficult.

NEUFELD: OK. The troops that were assigned for units to training for that, was that in 1944 or did that start earlier?

HEIMBURG: No, that was earlier.

NEUFELD: Earlier on.

HEIMBURG: Ja. You know, we had a training ground for troops in Poland, and this was a special division which was trained for the A-4 in Poland, and how was that?

NEUFELD: Heidelager.

HEIMBURG: Heidelager, yes.

NEUFELD: Blizsna.

HEIMBURG: Blizsna. Who did that? And said, "I go directly in the target area in order to direct," who did that, was the target area, because he said, "If I am in the target area, I know exactly that it won't hit that spot."

NEUFELD: Von Braun himself tells that story.

HEIMBURG: I believe von Braun.

NEUFELD: I've read it. He said that they were trying to understand the air burst problem. He said they couldn't be, that if they sat right at the target ground zero that they wouldn't be hit, and then one landed very close.

HEIMBURG: These were the air bursts where we didn't know the cause for the air bursts. And wanted to find out, and you couldn't find out when you launched it over water, so the idea was, why don't we use Blizsna, and we can find out.

NEUFELD: Interestingly enough the idea originally came from Himmler. Because after the air raid, the first air raid in August, '43, he went to Hitler and said, "We must have been betrayed. We should move production underground," which of course became Mittelwerk. "We should move Peenemünde into Poland and launch them in Poland." All that came out of that was just the

launching ground at Heidelager, which was officially an SS launching area.

HEIMBURG: You probably had heard that Himmler wanted to have that whole Peenemünde under his jurisdiction, and he tried his darndest to get von Braun into that direction, and von Braun was an SS major, honoris causa, and I have seen von Braun in the SS uniform one time, and that was when Dornberger forced von Braun because Himmler came to visit Peenemünde. "You use that uniform." That was one time I saw von Braun in that uniform. And Himmler had, maybe you have heard that story, Himmler had talked with von Braun and had told him, "Look, when you go work together with us, you get more money than you get from the army." You've probably heard that story.

NEUFELD: Yes. The only thing that I would like to know about it is more, but the only source we have is von Braun, and he said that in February '44 Himmler called him to headquarters and said, "Why don't you come over to us?" and von Braun refused to do it, and then of course the arrest only came about three weeks later, something like that, when he and Grottrup and somebody else whose name I forget --

HEIMBURG: Riedel, Klaus Riedel--

NEUFELD: --Klaus Riedel were thrown in jail and were only salvaged by Speer and Dornberger's efforts.

HEIMBURG: Right.

NEUFELD: So some time in '43 was the one time you saw von Braun sort of forced to wear an SS uniform for Himmler's purposes. Did you encounter Himmler at that time, from a distance?

HEIMBURG: No.

NEUFELD: Just he was there somewhere. So you built the Wasserfall test stand. I wasn't clear exactly what your job was next. In late '43 the test stand was finally finished for Wasserfall engines. When did you first test a Wasserfall engine, do you know? Immediately after you were gone from that job?

HEIMBURG: That must have been already in '44, I'm not sure, end of '43 or beginning of '44.

NEUFELD: Do you know anything about the success of that early test with that larger --?

HEIMBURG: We had no major problems. We had problems but these were not major ones, problems which could be resolved easily.

NEUFELD: Yes, because of course part of it was that the injector plate was finally fixed for Wasserfall.

HEIMBURG: Yes, right.

NEUFELD: But that didn't prove to be as large a --

HEIMBURG: We had two or three designs of the injector plate, and worked them out, and strictly by how much of a vibration do you get, and took.

NEUFELD: Do you know whether you ever had much success with the injector plate on the A-4 size engine tests? I'm not clear on whether they stopped doing that.

HEIMBURG: We succeeded late in 1944 with an injector plate for the A-4, where we could say, now, this the way how we can do it. We had to cool it, and then it was real quiet, real quiet. We were surprised ourselves. But that was late, and you know, to get that in production, that takes quite some time.

NEUFELD: I know effectively that trying to produce a second design for the A-4 motor was sidetracked by the pressing need to mass produce the original design.

HEIMBURG: That's right. That's right. We had too much to do on the test stands anyhow, so you could not make time on the test stand for that problem, because you had more pressing problems for the A-4 compromise design. With the 18 pots as we called it.

NEUFELD: So when you finished the Wasserfall test stand, you immediately were assigned in some way to the problem of mass producing the A-4 engine?

HEIMBURG: Yes, which came up with the mass production, came up with the tests stands and the test facilities, and the production, I went to the Mittelwerk only one time, and that was already very late, where I could only say, that is a place where I never would like to work. I was there one day, and that was again on account of Scheufelen, Scheufelen with his anti-aircraft project, you know, with the small rockets. They were produced at the Mittelwerk and he launched the first ones even from the Mittelwerk, from the top of the Mittelwerk, and he had asked me once, why don't you come? we have a few problems. And I went there.

NEUFELD: That would have been very close to the end of the war?

HEIMBURG: That was very close to the end of the war.

NEUFELD: Was it after Peenemünde was evacuated?

HEIMBURG: That was at the time of the evacuation of Peenemünde. You know, where we went to Lehesten, and just to give you an idea of that, we had made our plans in Lehesten how to build a test stand for a complete rocket, and that had to be approved by Berlin. So I went to Berlin with the drawings, and I forgot who it was but somebody in a pretty high position looked at it and said, "I like it. But why don't you finish your design? Why don't you complete it first before I give you the money?" And then I asked, "Does it look that bad?" And he said, "Worse." I said, "OK."

NEUFELD: Meaning the state of the war.

HEIMBURG: The state of the war. Then I have only one interest, that the people there do not get drafted in the army. And he told me, "OK, I can give you this assurance, that that will not happen." And that was shortly before Christmas, '44. And I know that von Braun came on Christmas to Lehesten, and he wanted to know, how do things stand? And I told him about that visit in Berlin. He said, "OK, I have similar feelings."

NEUFELD: Just hold out. It's pointless.

HEIMBURG: Yes. It's pointless. Hold still.

NEUFELD: But your job was, immediately after the completion of the test stand for Wasserfall, your first job was at, who were you assigned to? What unit were you assigned to, what test stand were you assigned to at Peenemünde at the end of '43?

HEIMBURG: I was not assigned any more to any of the test stands, but I was strictly an assistant to Hueter. So all the problems that came up in testing, I had my fingers in, let me express it this way, or had to solve the problem, whatever came up.

NEUFELD: Hueter, I guess we need to get more specific information about the relative positions of people. Thiel was killed of course in the air raid.

HEIMBURG: In the air raid.

NEUFELD: In August, '43, which meant that Schilling moved up to his job.

HEIMBURG: Schilling moved up, right.

NEUFELD: And did Hueter move up at that point?

HEIMBURG: Hueter moved up to --

NEUFELD: --to being in charge of test stands?

HEIMBURG: He was in charge of the mechanical side of the test stands. You know, you had the mechanical side, you had the instrumentation side, and you had the development side. The development side, that was Heller. That is, working with different fuels, and the first tests with hyperbolic fuels were made, so that was Heller's job. And the instrumentation side, you may have heard that name, that was Hackh. He was in charge of instrumentation. I have mentioned, as long as you had a failure and you could define the failure, this was fine. Only if you were unable to define the failure, what was the reason of that failure, that was always a problem. And instrumentation was actually a criterion. Very often you had to come out with more instrumentation.

NEUFELD: So it's constant struggle to define new ways to measure pressures, temperatures --

HEIMBURG: -- right -- flows --

NEUFELD:--flow rates and flows and so forth, in order to get a good idea of what happened.

HEIMBURG: What happened.

NEUFELD: In any given test. In the mechanical third division then, the mechanical was under Hueter.

HEIMBURG: Hueter. And I worked under Hueter. Schilling had all three divisions or however you want to call them.

NEUFELD: And propulsion system development in general.

HEIMBURG: Yes, in general.

NEUFELD: Was there anybody between those two levels, Schilling and then --or were Hueter and Heller and Hackh the next level down on the organization chart?

HEIMBURG: On one level, Hueter, Hackh and Heller.

NEUFELD: So you were sort of an assistant --

HEIMBURG:--to Hueter --

NEUFELD: --to Hueter at that point. Schilling I know very little about. Can you describe Schilling?

HEIMBURG: Schilling was originally a physicist. And as far as I know, he was drafted into a position at Peenemünde, but as a

civilian. He was an assistant at the Technische Hochschule of Hanover, and Thiel talked to Hanover, we need a man of that and that education, and then he was told, OK, you go to Peenemünde, by the Hochschule. This is how he came to --

NEUFELD: About what time? Before you or after you?

HEIMBURG: Before me. I would guess, I am guessing now, about '40.

NEUFELD: So he had moved up through the organization, in terms of test stands.

HEIMBURG: Probably, as he was from the beginning, let me say, an assistant to Dr. Thiel. And Dr. Thiel was very active, not active, very active. He wanted to have his fingers everywhere. and had it, and I see that strictly positively, on the side of -- many people complained about him. I could not.

NEUFELD: What did they complain about? Was he an abrasive personality?

HEIMBURG: He got into everybody's business--to some extent, rightfully. And people didn't want to see that.

NEUFELD: It sounds a little bit like von Braun's management concept also, always know what everybody's doing at all levels.

HEIMBURG: You know, von Braun had, I want to say it, some day it was presented in a different way. Von Braun was constantly on the road. He visited that, he visited that, he visited that. And with the idea in mind, when I do that, I always learn something. And when he came back, he came with new thoughts. He said, "You can look at it this way, you can look at it this way, you can look at it this way." I saw that very positive, this interference, and this was an interference, but very positive, because you had to have somebody who had his fingers everywhere, no matter what. In order to learn something, how can we use that information or that information or that information? And Thiel had similar approaches. Only he was not that often on the road as von Braun.

NEUFELD: I guess he had a narrower range of activities, basically power plant stuff. It was mostly concentrated right at Peenemünde.

HEIMBURG: Yes, that's right.

NEUFELD: Yes, I never asked you what you thought of --how Thiel was as a personality. You liked him?

HEIMBURG: I could work with him, not only well but very well. OK, I tell you a story.

NEUFELD: So Thiel was a very intelligent man.

HEIMBURG: Yes. That was the only time, what I told you, when I had a different opinion.

NEUFELD: I gather it was a great loss to the project when he was killed in the bomb raid.

HEIMBURG: Yes. Yes, it was, including his whole family. If he had stayed in his house, nothing would have happened. He went into the air raid shelter, and the air raid ditch with his family, and all four were killed.

NEUFELD: Yes, it was a tragedy. OK, and Hueter finally, you got along with him very well?

HEIMBURG: I got along with him very well too.

NEUFELD: What was his background?

HEIMBURG: He was an engineer. So he came from a technical school, right, and so the two of us never had a problem there. You know, constantly, some project came up that had to be resolved, and mainly with the mass production, which we had to resolve.

NEUFELD: So your job then was, you were in Hueter's office and it was, constantly you were getting documentation, meetings, whatever, regarding the problem of putting the engine into production.

HEIMBURG: Yes. Right.

NEUFELD: Mostly in '44.

HEIMBURG: '44, right.

NEUFELD: So your job on a daily basis, was you know --maybe I should ask you that question, what did that mean on a daily basis for you?

HEIMBURG: You know, there came problems where I worked for a week or two weeks or four weeks, there were problems where I worked only for hours.

NEUFELD: Would that mean changing design components, or materials shortages or?

HEIMBURG: Material shortages came in too. You know, during the war, all of a sudden the steel plant was bombed out and could not deliver the steel any more, and you came to a different material, and the different material in the combustion chamber, for

example, showed we have a difficulty here, we have to change the cooling system a little bit, because the combustion chamber burned out, because the heat conductivity of the material was different than the material before. So this is for example one problem. OK, let's go at it. We had shops at Peenemünde. We could say, we have then to drill a different hole pattern into the combustion chambers. You know, we had these 18 pots and since we had the 18 pots, we had zones and when we had too hot a zone we'd simply cut a hole into the combustion chamber and from the outside we had these rings with fuel, and we'd put liquid fuel into the combustion chamber to cool that spot.

NEUFELD: Right, the film cooling along the wall.

HEIMBURG: Right. Right. So this is just one example.

NEUFELD: So you would have to specify a different arrangement of holes for film cooling?

HEIMBURG: Well, we did not specify it. We went right away to the test stand, and cut it on the test stand.

NEUFELD: OK, you would get a problem like that and you would say, OK --

HEIMBURG:--go to test stand number 8 and work with the people of test stand number 8, we drill a hole here, we drill a hole here, we drill a hole here, OK, now let's try it.

NEUFELD: But would you have the material, for example? Your example, you had to change the quality of steel or something used in the thing. Would you immediately have the material in order to test what the alternative was?

HEIMBURG: No. No. The only way was, OK, how can we correct that? You are right. Normally you would say, we would go back and would go to the steel plant, but there you would have difficulties already with the material, and therefore, you tried to solve the problem, not as you normally do, you go to the source, but you solve it yourself, the final product. Because if you go to the source, it takes by far too long--until you come to it and decide that, you're already in the manufacturing process. And you did not want to hold that up.

NEUFELD: So you just tried to experiment with the materials until you said, this works.

HEIMBURG: Yes.

NEUFELD: Send this down to Mittelwerk with this, these new specifications, working with this material.

HEIMBURG: Yes. We made the drawing, sent it to the Mittelwerk, this is how the combustion chamber should look like now.

NEUFELD: It was constantly struggling to produce new production drawings?

HEIMBURG: Yes.

NEUFELD: Of all the flight parts?

HEIMBURG: Let me say, not to produce new drawings, but to correct the drawings according to the results which came up through the new material.

NEUFELD: Does that mean you just produced specialized drawings of individual changes?

HEIMBURG: No, you changed the original drawing.

NEUFELD: You changed the original drawing.

HEIMBURG: You changed the original drawing, saying, this is how it looks now, and you had your numbers on it, a, b, c, d, e. You use now, drawing e, number so and so e.

NEUFELD: So it's sort of like, you produced a new version of the same, you would change the original drawing.

HEIMBURG: Yes.

NEUFELD: Then you would produce the blueprint style copy of it.

HEIMBURG: Yes.

NEUFELD: And send that off, you would send that off. So was that a -- ...would you then have to be doing that basically, you worked ten, twelve hours a day virtually all the time just constantly struggling to keep up with individual changes and problems?

HEIMBURG: I had a living quarter at Koserow. You know, in 1943 we were dismissed out of the army but we had to stay where we were, but we were in civilian clothes, and I had a living quarter in Koserow, and I had even a car. I could drive to Koserow with a car. You know, since we mixed the gasoline with alcohol, we could elongate the amount of Benzin we got--

NEUFELD:--gasoline --

HEIMBURG: Gasoline. We could elongate it considerably. So I was

not depending on the railroad. But still, when you are through sometimes at 10 or 12 o'clock, you did not like to drive now for another 15 miles.

NEUFELD: So it was on Usedom?

HEIMBURG: On Usedom, yes. So I had another quarter at Peenemünde, close by. There were a few buildings where you had sleeping rooms, where you could live, and I stayed there usually during the week, and only on Sunday went back to that quarter in Koserow. That was a time--that was not eight hours, that was usually twelve, fourteen hours a day.

NEUFELD: And if you're lucky you had Sunday off.

HEIMBURG: If you were lucky you had Sunday off, yes.

NEUFELD: That was it.

HEIMBURG: You were working continuously, essentially.

TAPE 3, SIDE 1

NEUFELD: Now, we can return from the present to 1944 and figure out, what was it, what things do we need to cover, what you were doing? We talked about your time under Hans Hueter, and to some extent, I don't know whether, is there more to say about your experience working under him with production problems and so forth? Are there any aspects of that story that I haven't covered in my questions? Can you think of?

HEIMBURG: Right now, I do not have the feeling that we had there an open problem. You know, what I believe, what we should discuss now is since production of the V-2 became considerably higher, and since it was obvious you could not produce without test stands, especially on the combustion chambers, I had, and even on the pump side, they all had to be tested, so you needed more test stands, and therefore, new facilities were created like that one in Lehesten we had discussed shortly before, with two combustion test stands for power plants, well, not power plants but combustion chambers, and the same way, and that's what I forgot to look up, you know, where that station was located in Austria. But it was closer to the Bavarian border.

NEUFELD: Was it in the southern part near Salzburg? Along that?

HEIMBURG: It was not far from Salzburg.

NEUFELD: It wasn't far from Salzburg.

HEIMBURG: No. East of Salzburg between Voecklabrueck and Voecklamarkt on the water shed.

NEUFELD: And it was originally a brewery, you said.

HEIMBURG: A beer brewery. And you could then put the oxygen plants into the brewery because the brewery was underground. That was built underground, since you didn't have cooling plants, in order to have the year over generally even temperature-wise, even climate in the brewery, and you could prepare the combustion chamber for the test, and they built on one hand a tower, and you had to have a jet deflector. It was not as in Lehesten, you had a natural wall, perpendicular wall. You had to have a jet deflector, and on the other hand, in order to protect it from bomb raids, they had a heavy concrete layer on top of that tower. Now, you had two test stands inside and --you have to see it this way.

NEUFELD: Can you describe that visually?

HEIMBURG: In the middle is the room from where you direct each test, to the left, right. You had a concrete wall separating you from the test stand, but you were very close by. But you had the concrete wall and you had a window so that the noise was not too damaging to you, too damaging to your ears. And you had then the containers sitting on scales for the oxidizer and for the fuel, so that you knew how much fuel did you use and how much oxidizer did you use during the test, and you could see the containers on account of the scale getting empty. Now, I have to tell you something about the scale. When I arrived there, the container, on account of the vibration by the test stands that were close by, had shifted slightly against the wall, and that of course made the scale worthless. This was one thing which they had not watched. On the other hand, when you pressurized your container, and you -- the scale, or let's say when you fuel your container and your scale is not working properly, your fuel goes out over the de-airing line when you take the pressure off, you have a line to take the pressure off, when you have your scale blocked, they're over-fueled, and it's drawn out the other side. But, here comes the part, there was a welding seam in this tube and the welding seam had broken, so when they over-tanked, the fuel ran back.

NEUFELD: Was it alcohol?

HEIMBURG: It was alcohol, ran back and you could smell it. Here is something badly off. They didn't care about it. So you knew, that is highly dangerous for fire, and the first thing I did when I came there, I closed it down. I said, "That's an impossibility there; for us to correct that," and we corrected it, and I could only say, "OK, the other side you have to correct as well. You

cannot leave it that way, and you have to watch it." And after I was gone, after months or so, that line broke again, and the tank again came close to the wall and again didn't work. When I left, I could only say that facility is highly dangerous. And when one day, we got a call at Peenemunde, you know, there was a big explosion at Schlier, and the whole crew has been killed. So I was sent there, and I told you that story.

NEUFELD: When Oberth's daughter was killed in it.

HEIMBURG: His daughter got killed. I had to see that a new group of people came there who built it up and could operate it again. That was one part of my activity, being called from Peenemünde, but this test stand did not belong to Peenemünde. That belonged to a completely different organization. Only Peenemünde was called, "You have to help out here."

NEUFELD: OK, under what organization, was that officially under Mittelwerk or?

HEIMBURG: That was officially under Mittelwerk. (crosstalk) The same control.

NEUFELD: And Lehesten was also owned by Mittelwerk.

HEIMBURG: Lehesten, same thing.

NEUFELD: First I want to ask you the detail of, when was the first time you went to it, was it Schlier?

HEIMBURG: Schlier.

NEUFELD: First time you went to Schlier, when was that?

HEIMBURG: That must have been the middle of '44, that time.

NEUFELD: And the accident?

HEIMBURG: I mentioned that the Russians came closer to Riga, and that friend of, that director of the Mittelwerk, the name you know --

NEUFELD: The director of Mittelwerk's name, Rickhey?

HEIMBURG: Rickhey, it was a friend of Rickhey who was put in that facility, and Rickhey was the one who had requested that the man in charge was taken out. And I could only say, the man in charge was pretty weak. When I came there first, I told him a few of the weak spots as I saw them. Said, "Well, don't forget you are in that and you work continuously at it, and I was outside, I didn't see that," but on the other hand you could say, "Why didn't you

every month once go back to Peenemünde and see what kind of changes have been made? In the development you have continuous changes." But this is where I saw the difficulties in that the tanks were touching the wall and therefore the scale did not work properly and you had a split in the decompression tube of the alcohol tank. And I could only say, we can only close it down now and correct it, and we have to correct the other side too, and if you do not watch it so that this repeats it, it will again--and you can have from today to tomorrow, an explosion.

NEUFELD: The last facility was also built towards the middle of '44 or early in ?

HEIMBURG: Late '43 or early in '44, and that the Lehesten facility was by far better organized, and in a by far better condition than to the south, and there was a very energetic manager who dictated and properly, I could only say. I was surprised. That plant was in a very good condition.

NEUFELD: Did more Peenemünders have contact with that facility than the other one, or was it just the manager?

HEIMBURG: It was just the manager. That was the manager.

NEUFELD: That brings up the question--

HEIMBURG: Just an example, to show you what kind of nonsense a manager can do when you work with liquid oxygen or gaseous oxygen coming from the tank, this is a very very cold gas, and you cannot take steel, you have to take copper, because steel gets so brittle that with one hammer blow you can destroy the piping, and they had an accident at Schlier very early where one of those lines broke, and then they had an explosion, because the manager said, "No, we do not take copper, copper is so scarce in Germany we cannot use it," and he took steel without knowing how dangerous it was.

NEUFELD: So you must have had a problem with those operations, and in effect, they were created new without sufficient knowledge of all your experience at Peenemünde.

HEIMBURG: Yes.

NEUFELD: And they were largely staffed without any people from Peenemünde.

HEIMBURG: There was hardly anyone. Here in that case one man. But he himself didn't have enough experience.

NEUFELD: Now, maybe you can make more sense for me, how the whole production process and testing of the engines was done on a mass

production basis. Were the combustion chambers still made in Breslau, or a whole bunch of different places?

HEIMBURG: As far as I remember, they were manufactured in Breslau. And I am not clear how many, which percentage was manufactured, for example, at Wiener Neustadt. There was, maybe later on when Tessmann is coming, we can ask him that question. I told him I would give him a ring, so when we are through, I can do that and we can ask him that question. Where was the manufacturing done of combustion chambers? I don't believe all the combustion chambers were manufactured, especially after they started with the high production figures, at --Linke-Hofmann was the name of the company in Breslau--could manufacture them all. But the point I was making, they all had to be tested and calibrated. And at the time when that came up, neither Lehesten was at work nor Schlier was ready to test, so we had to test all of them at that one test stand number 8 at Peenemünde, whatever we could, and they worked in one shift 16 hours a day, and they ran the test and took the chamber out and put the next one in spite of the fact that they might have to repeat the test. It was faster to change the combustion chamber in the test stand than to wait until they had the evaluation of the test. So some of the tests had to be repeated, so they put it in for a second time. I know that von Braun at that time was really hard pushing, get out whatever you can, and one day I told him, "We have to close it because the jet deflector is damaged, and we have to repair it," and he told me, "Look --go as long as you can, and even if the whole deflector is blown out, with it," so it was a lousy situation, and we finally had to close it down. It didn't help, we had to repair that deflector.

NEUFELD: Was that earlier in '44, the first half?

HEIMBURG: I think that was the first half of '44, when that happened.

NEUFELD: That's the point where you didn't have any alternative place to calibrate.

HEIMBURG: There was only that one test stand.

NEUFELD: From the standpoint of manufacturing, the injectors were made some place, were made at Breslau other locations, at the same place as combustion chambers, or where they were combined, the combustion chamber itself was made somewhere--?

HEIMBURG: I couldn't tell you where the different parts were made. I'm pretty sure that, for example, the little pots which were in the 18 small combustion chambers were not manufactured at Breslau, they were manufactured somewhere else and sent to Breslau, so in that sense, Breslau was the plant where the

combustion chambers were assembled.

NEUFELD: Yes, because I think when you get down towards the end of the war, then you find that so many things have been put underground at Mittelwerk, increasingly operations that were once at somebody's factory, they picked up a whole, they picked up the labor force and the tools and shipped them all and put them underground, so I think probably in the last part of the war at Lehesten they were testing engines that were made right there at Mittelwerk, weren't they?

HEIMBURG: I'm not sure if combustion chambers were manufactured at Mittelwerk. I don't believe so. I believe we still got them out of the east-- you know, the west side of Germany was badly damaged by air attacks. The east side of Germany was not so bad off.

NEUFELD: Yes, Schlesien was relatively protected -- Silesia was relatively protected from air raids.

HEIMBURG: Right.

NEUFELD: So as you were doing it in the beginning, the combustion chambers with injectors would be shipped to you, you would calibrate them and then send them to Mittelwerk for integration in to vehicles?

HEIMBURG: Yes. Right.

NEUFELD: Does that mean, as you were saying, that they had to be individually tested and calibrated, does that mean that for each engine there would be a specified performance, whatever attached to it, so adjustments would have to be made in fitting it into the final vehicle?

HEIMBURG: Yes, you know, with the pumps, this was exactly the same. The pumps were calibrated too. And you took them, when you had a higher pressure loss in the combustion chamber, you took a pump which was a little bit more powerful, together with that one.

NEUFELD: So you tried to match them.

HEIMBURG: Yes.

NEUFELD: And you were getting turbopumps shipped from companies to Peenemünde at the beginning?

HEIMBURG: Yes.

NEUFELD: And you also had to run long shifts there.

HEIMBURG: That's what I had mentioned. When we put them together in a vehicle, we calibrated in the vehicle the pumps together with the combustion chamber. That is all. You had the whole power plant there. And there we learned enough that we could say, all right, if the pump has this calibration characteristic, you put it together with such a combustion chamber. If it has such a characteristic, you put it with such a combustion chamber. Because later on we didn't test the whole vehicle any more. You know, we tested only the pumps and the combustion chamber, separately.

NEUFELD: Did you continue to do that in any large numbers after you had Lehesten and Schlier? I mean, did you continue to get large shipments of pumps, of combustion chambers, had to do part of the work load of that stuff at Peenemünde, or was that pretty much gone?

HEIMBURG: As I mentioned, after we had run let's say 100, I pick out of the air the figure right now, 100 different pumps, and combustion chambers, together in this calibration test stand, so that you had now, your combustion chamber calibration and you had 100 different pumps, you could say, OK, this is the characteristic now of the combustion chamber, therefore you take such a pump, without testing them. Together. You tested them separately and you could then coordinate it according to the results of your calibration test. Of the pump.

NEUFELD: You misunderstand my question. I'm asking you, did Peenemünde stop with this sort of testing of mass numbers of industrial pumps at any time, or did you continue right through the war doing part of the work for Mittelwerk in terms of the mass production?

HEIMBURG: We did, on that test stand number 8, we did part of it, for the Mittelwerk.

NEUFELD: All the way through.

HEIMBURG: Because we tested by far more combustion chambers than we launched vehicles. You know, vehicles we launched, the highest time was every two weeks one. And later on, that was less. And we tested at least 24, 30 combustion chambers in one shift. So the surplus was sent to the Mittelwerk, whatever we did not use, and that was by far less, so mainly we tested for the Mittelwerk.

NEUFELD: And that all the way through to the end, until things fell apart.

HEIMBURG: Right.

NEUFELD: Did that continue right down to February, 1945, when you began to evacuate?

HEIMBURG: I do not even remember any more when we started to evacuate. I think that was earlier than February. Oh, definitely. Definitely, because we were already on Christmas, 1944, we were at Lehesten, so we had evacuated let's say in November of 1944.

NEUFELD: You were evacuated at that time as well.

HEIMBURG: Right.

NEUFELD: See, that's different than most of Peenemünde. I mean, obviously there had been dispersion of people and dispersion of tasks throughout this time before that, but most of the place was really evacuated in February and March. But that testing of engines was pulled out before Christmas.

HEIMBURG: Besides that, for the testing itself, especially when you intended to build a new facility for total vehicles, you had to take material along too, and that you didn't do only in one transport so you had to have quite a few transports from Peenemünde to Lehesten.

NEUFELD: Right. So before that time, I had a question, I had a couple of organizational type questions which you may not know much about at your level. Number 1, in 1943, Dornberger moved away, became the general ZBV--

HEIMBURG: ZBV, zur besonderen Verwendung.

NEUFELD: He was away from direct control over that time. A different group of ordnance officers took over under General Rossmann, and I was wondering whether you, did you have any experience with the change in the relationship with the army ordnance people then? I note some people told me that there was friction, but did it --did you see any difference at all?

HEIMBURG: I did not see any difference. Not at all. Not at all. You know, I could imagine that in the general --on the business side, that there were differences of opinion, you know, how do you pay for that, how do we pay for that, can we build this up, can we invest that money for that or that or that possibility which came in new?--that they had difficulties. But I was not aware of difficulties there.

NEUFELD: You weren't aware that there was any greater or any more influence, any more friction with the army ordnance officers or anything?

HEIMBURG: No.

NEUFELD: Before or after that time.

HEIMBURG: You know, there was a change every year or every half year. Half a year Dornberger was in, and half a year, what was his name, a colonel?

NEUFELD: Zanssen was there.

HEIMBURG: Zanssen. Zanssen. With Zanssen it was by far more difficult to work than with Dornberger, and they changed. Half a year, Dornberger was in Berlin, and half a year Zanssen was in Berlin, and it was always either Zanssen at Peenemünde or Dornberger. And Rossmann, he was the last one. Zanssen had asked, in spite of the fact that he as a pessimist and he knew the war was lost, but he asked for a transfer to the Eastern Front.

NEUFELD: So you didn't hear the story of Zanssen's removal, did you?

HEIMBURG: No.

NEUFELD: Did you know that he was actually accused by the SS of being involved with the oppositional--

HEIMBURG: -- yes -- yes --

NEUFELD: --Catholic priests, and was essentially, you know, forced out as a result of that? That was I think after he had asked for transfer already.

HEIMBURG: You know, Zanssen had shown very clearly that he was not convinced of the Nazi side. In spite of the fact that he was an early member, an early member of the Nazi party. Before 1933. And it could well be that Zanssen thought, because he was an old member, he could open his mouth once in a while. I believe that played a role in that, too. But in the final end, he decided himself, I want to get out of here. Probably because he knew, if he didn't do it on his own, he would be removed by the SS. This was, probably.

NEUFELD: He was actually forced out, because I've seen the documents on this.

HEIMBURG: Oh?

NEUFELD: He wasn't, it's not, the SS didn't push super hard, but they brought up these charges against Zanssen, and then the army --and I don't know the full story, but it appears that the army leadership decided it wasn't worth the trouble of protecting Zanssen, let's transfer him somewhere else.

HEIMBURG: OK.

NEUFELD: And so they didn't cover for him. I know he was a very close friend of Dornberger's.

HEIMBURG: He was. He was.

NEUFELD: Did you know Lieutenant Colonel Stegmaier?

HEIMBURG: Stegmaier, yes, I knew him. By the way, he was an old member of the party too, Stegmaier, and I had very little to do with him. Schilling and Thiel had by far more to do with him than I. So I heard only through them the difficulties that once in a while arrived, arose, with him. But I personally had no contact whatever.

NEUFELD: What were their complaints about Stegmaier?

HEIMBURG: Narrow mindedness.

NEUFELD: Just very rigid in the way he wanted to do things?

HEIMBURG: Yes, exactly, that.

NEUFELD: Was he considered a competent administrator?

HEIMBURG: Well, since he was so narrow minded, you can only say he was a competent administrator if difficulties arose how he would help to solve them. And in that sense, I would say he was not a good administrator. But I had no direct connection, therefore I could only repeat what I had heard from Schilling and Thiel.

NEUFELD: I don't even have Stegmaier's first name. Do you know his first name?

HEIMBURG: I didn't ask.

NEUFELD: OK. He did not have a --you knew that he was an old member of the party. Did he have a reputation of being an enthusiastic Nazi? Or not?

HEIMBURG: I could not answer that. I could not answer that.

NEUFELD: I've seen that said about him. I'm trying to get as many views as I can, of the evidence, but I do know one thing which indicates that he probably was. He had very good connections with the top of the SS. There's documentary proof of his intervention at the top levels of the SS, as well as documentary proof that he was the person who did in Zanssen.

HEIMBURG: Oh?

NEUFELD: That he said things to --that after Zanssen's problems came up, Stegmaier was the one who said, told various nasty rumors about Zanssen which weren't probably true. I found these things in files in Washington.

HEIMBURG: I know only one thing. You know, the Gauleiter from Stettin came for a visit. Zanssen mounted his horse and didn't say hello to him. Just as an example, in spite of the fact that he was an old member of the party, he didn't want to see him. But he showed that to other people.

NEUFELD: So he was a little foolish, you think?

HEIMBURG: In my opinion, that was foolish. That was not a necessity.

NEUFELD: I'm getting the picture from other people the same, that Zanssen was a little careless.

HEIMBURG: Yes.

NEUFELD: In showing his distaste for the regime.

HEIMBURG: You know, you can say, careless is very tender to Zanssen. It was in my opinion more like (crosstalk)

NEUFELD: --more like reckless--

HEIMBURG:--just dumb.

NEUFELD: But when Rossmann came in you didn't note any difference. You didn't have much to do with him at all, right? Or any of those people?

HEIMBURG: No. Not at all. Not at all.

NEUFELD: The second organizational change is when you were converted into a government company instead of civil service, officially, as Elektromechanische Werke.

HEIMBURG: Right, right. Right.

NEUFELD: Did you notice much difference when that happened?

HEIMBURG: Yes, there was a difference, because von Braun's --let's say-- power was not any more as big as it was before. His, how do you say, his influence was to quite some extent reduced. To give you an idea, all of a sudden, Steinhoff,

Schilling, they are put on the same level as von Braun, organizationally. Which didn't effect, let's say, Schilling or the others. They worked the same way with von Braun as before. But they showed him, your influence is somewhat reduced by the organization.

NEUFELD: That's interesting. I get different answers from different people, when I ask that question. Some people don't see any difference, and some people see a significant difference.

HEIMBURG: Yes. As I tried to explain, it's still Schilling or Steinhoff. They listen to him the same way as before. There was no influence in this respect, only from the topside. They showed him, you are now on the same level with the others, from the topside. Not from the side below. So when you see it from the side below, that is exactly the same.

NEUFELD: It looked like it functioned informally more or less the same.

HEIMBURG: Yes. Right.

NEUFELD: Did you have anything to do with Storch? This new Siemens director who was imposed on you as president of this company, as it was structured?

HEIMBURG: I did not see any big changes in the total approach which we had. There were a few things that were different than before, OK. You could see when the new boss was coming, he always has his own properties and introduces a few changes which, in my mind, did not make any big difference. That's all.

NEUFELD: One of the funny things I see when I look at some documents from the period is that Storch seemed to issue a blizzard of memos about little things, but you know, whether it's vacations or other things, it seemed, but I don't know, maybe those same kinds of things were produced before and I just didn't have the documents.

HEIMBURG: I would say that was of little influence, little influence.

NEUFELD: You were working incredibly long hours.

HEIMBURG: That's right. And this did not change when Storch came in. This was exactly the same as before.

NEUFELD: You just sort of went, on a daily basis you spent virtually all the time there from morning tonight and then you just slept usually in Peenemünde all week along.

HEIMBURG: Right. Right.

NEUFELD: So it didn't leave much time to do anything else, 1943, '44, I suppose.

HEIMBURG: I hardly read any, at that time, I hardly read any newspaper. When you came out from your job, you had your lunch at the site too and your dinner, and Peenemünde had one advantage, since it was close to the water, you had fish, and the fish were not on stamps, so you were better off than when you were outside of Peenemünde. In Germany. You had better food.

NEUFELD: So you were able to get fish from the local fishermen and so forth.

HEIMBURG: We had fish.

NEUFELD: Would you say that living conditions deteriorated in 1944? Or you were reasonably well maintained?

HEIMBURG: Reasonably well maintained, that's all I can say.

NEUFELD: Did you feel isolated from the outside world to a great extent there? I guess if you're involved a lot with thinking about industrial production in other parts of the Reich and how you were going to get things done, you did have some sense of the impact of air raids and everything else.

HEIMBURG: Yes. I always had the possibility, if I want to find something out, I could go on TDY and could check personally, how is that, how is that or how is that, when we had shortcomings somewhere.

NEUFELD: Yes. This is really minor stuff, but I'm just trying to get an atmosphere of what it was like there, get a sense of atmosphere, living conditions.

HEIMBURG: I could not complain. I could not complain about that.

NEUFELD: Was this incessant testing of calibration of the engines and so forth, day in and day out, did that become very tedious, the same work over and over and over?

HEIMBURG: No, not so, because your business was only in case something went the other way. Whatever went normal, you were not interested.

NEUFELD: So you were not directly involved in the daily testing.

HEIMBURG: In the daily testing, I was not involved.

NEUFELD: You were in the office.

HEIMBURG: In case something went wrong. Then I was there.

NEUFELD: But the test stand crew were almost doing assembly line testing virtually on test stand 8.

HEIMBURG: It was. It was. It was assembly line. I could only say, they were kept so busy, they didn't have time to think about their own life.

NEUFELD: I'm trying to think of there's anything else left. You talked about the Schwimmweste before in 1944. I guess we've said about everything there was to say. That project was completed?

HEIMBURG: The project was completed.

NEUFELD: But never used?

HEIMBURG: Never used. That I know of. You know, after we had left, had left Peenemünde, we had nothing to do any more with the air force, so they probably worked on their own. I know only from Scheufelen. Scheufelen was in the Mittelwerke. But he was concerned with the small rocket.

NEUFELD: Taifun.

HEIMBURG: The Taifun.

NEUFELD: Did you have anything to do with Taifun at all?

HEIMBURG: Nothing at all. That was Scheufelen's business.

NEUFELD: That was carried on pretty much by Luftwaffe officers. Where was its location in the organization? Who was he under?

HEIMBURG: In the organization, he was under me. Right. But after he had his own project, his Taifun, then he was strictly only under the air force, and they had a major there, I forgot the name, who was in charge of the total air force operation, air force group.

NEUFELD: Was it under the label of Flakversuchsstelle?

HEIMBURG: Flakversuchsstelle.

NEUFELD: Did they have a distinct location, in other words, a building or distinct offices separate from you?

HEIMBURG: They had an office in our headquarters building. But that's all I can say.

NEUFELD: It wasn't like they were concentrated all in one place.

HEIMBURG: Like we at Peenemünde. Yes. But you had people who were responsible for the manufacturing. That was a Lieutenant Minning. He came here too. He's somewhere on the east coast, Minning. ...

NEUFELD: So he had the production side?

HEIMBURG: The production side for Wasserfall, and he was in charge of the first vehicles which were manufactured at Peenemünde, and I do not know if he had the responsibility too, to transfer it to industry for bigger numbers. This I have not the slightest idea how that was handled. I had nothing to do with it.

NEUFELD: Yes. I don't have much information myself.

HEIMBURG: That's the reason that I can say, after we left Peenemünde, I do not know where the Schwimmweste went, if the Schwimmweste was ever used. Tiesenhausen could eventually know that.

NEUFELD: But as far as the presence of the Wasserfall air force people, the Flakversuchsstelle people, they were dispersed throughout the installation.

HEIMBURG: That's right.

NEUFELD: Mixed in together with the army.

HEIMBURG: That's right, even in the design too.

NEUFELD: They just had a separate little headquarters office for them inside your headquarters.

HEIMBURG: Right.

NEUFELD: OK. I'm just trying to make sure that I've covered all aspects. There's the submarine launch thing that you talked about before, but you said you weren't much directly involved.

HEIMBURG: I was very little involved in that. Tessmann might have been more, I believe, I'm pretty sure that he was more involved than I was. He was in test in the design. You know, test had a design group of its own and Tess was the head of this design group. So this design group was involved in the design of the floating test stand.

NEUFELD: Were they involved in the canister project for towing the A-4 underwater?

HEIMBURG: I believe so. I'm not sure.

NEUFELD: And you said that the idea behind that was to create a distraction for the Americans.

HEIMBURG: Right. Right.

NEUFELD: So it was kind of a --it sounds a little bit like a desperation measure.

HEIMBURG: And it was. In my opinion it was. That's desperation, you could say, well, it's the end of the war.

NEUFELD: Certainly Taifun gives the sense also of being somewhat of a desperation measure. Throw it together at the last minute.

HEIMBURG: Yes, right.

TAPE 3, SIDE 2

NEUFELD: Now, at the end of '44 some time, did you say November or December, you went to Lehesten?

HEIMBURG: Yes, to Lehesten.

NEUFELD: Were you added on to a crew of people that had already been there? Did you join the operation?

HEIMBURG: We were not--we were independent of that group which was there testing the combustion chambers, and what we had in mind was to create a new test facility for complete vehicles, to check out things that might come up on the side of the tubes, in order to correct that. You know, we got some information from the groups, what has not functioned properly, and what had to be changed. And of course we wanted to continue with that, and therefore we had in mind, OK, to build a test stand up at Lehesten, and I believe I had told you that I went to Berlin after we had the first plans in order to get the necessary agreements with them to build it, get the money for that, and the answer I got at Berlin, which was, "Why don't you go on with your planning? We think your planning is pretty good." And my understanding was very clear, OK, you think the war is at an end, and that is the reason I asked the question, "Does it look that bad?" and he said, "It looks worse."

NEUFELD: So you went ahead with trying to build up a new test stand for complete vehicles before they were shipped to the field.

HEIMBURG: Right.

NEUFELD: So was your activity then mainly in planning?

HEIMBURG: Mainly planning. We had no other possibility. Planning. And then we got the order, you have to go to Oberammergau. And with other people they named, such and such people. We were about 50. We left in motor vehicles to go to the south, and there were quite a few from the different groups of Peenemünde. They came from different places. And this was an order of the SS. The SS probably tried to use us as an argument with the Americans or the British. This is what I believe. I'm not sure. And while I was there, they found out that our design group, they were not too far off from Lehesten, they had found out the papers were not burned. And Riedel had stated --

NEUFELD: Which Riedel is this?

HEIMBURG: Riedel III, who came here to the United States too. Riedel III, and we got three new bicycles, and all bicycles looked alike and I could only say, "How in the hell can you do that? You have three new bicycles and we go on the same trip, everybody will see that, that it's very strange." And at that time you know Lehesten and the other place were already occupied by the Americans. So we had to go through the lines by the Americans. And then we were held at one place for about two weeks and then we left again. When I arrived at Lehesten I was told that "an American colonel is waiting for you." And I went. I believe I mentioned that to you before. I visited him and said, "I am so and so," and he was really surprised when I mentioned that and said, "Where do you stay?" I said I stayed in the local hotel. "Would you please stay there so that I can call you when I need you, for questioning?" I said, "Sure. I'll do that." And then I checked and found out, the papers were burned. That was not correct, that the papers were not burned. They were burned.

NEUFELD: Which papers were burned?

HEIMBURG: Drawings and files, the files were burned, before the Americans came in.

NEUFELD: At Mittelwerk?

HEIMBURG: That was not Lehesten, that was Leutenberg. Leutenberg was not more than five miles away from Lehesten, where they were located, where Riedel was located with his group, and he could prove to me that he had burned the files. So I do not now how that was --who made the mistake to say, they didn't burn the files.

NEUFELD: There are a lot of questions I have about those details,

but first let me backtrack. You stayed at Lehesten from December through to the beginning of April approximately, is that when you evacuated to Bavaria?

HEIMBURG: About, yes.

NEUFELD: So in that time, you only worked on paper studies.

HEIMBURG: When did the Russians come into Lehesten, do you know that?

NEUFELD: Oh, that wasn't until June or July, July probably.

HEIMBURG: July. OK, I know it was summer time. When we were then evacuated by the Americans.

NEUFELD: But I'm talking about before the war was over.

HEIMBURG: Yes, right. Right.

NEUFELD: Before the war was over, you worked in Lehesten for a few months.

HEIMBURG: For a few months.

NEUFELD: For a few months. But you only stayed working on drawing board studies basically.

HEIMBURG: Only studies.

NEUFELD: And the Lehesten engine testing went on until March?

HEIMBURG: That went on independent from us. Until the Americans came.

NEUFELD: I know that Mittelwerke shut down March 18 or something like that.

HEIMBURG: That was probably around the same time.

NEUFELD: And then the Americans didn't come for a while, and --but you were evacuated to Oberammergau.

HEIMBURG: Yes.

NEUFELD: In that area. You stayed there for how long?

HEIMBURG: Oberammergau, not more than four or five, six weeks or so, before I gladly took that job going back.

NEUFELD: Why were you glad to take the job going back?

HEIMBURG: Instead of hanging around doing nothing. Somehow, I didn't like that.

NEUFELD: That's what you did basically after you got to Oberammergau, just hang around.

HEIMBURG: Yes, that's right.

NEUFELD: So you weren't connected to von Braun and Dornberger, that gave up on May 2. They were farther away.

HEIMBURG: No. Again, this is a question you can ask Tessmann too. Tessmann was at the same place as von Braun, when the Americans came in, and Tessmann was sent out to conceal files in the Harz Mountains.

NEUFELD: But that was even before the surrender.

HEIMBURG: That was before the surrender.

NEUFELD: Tessmann and Huzel, because it was Huzel, Huzel wrote his book about, I've read Huzel's book about that. But the thing that mystifies me about your story is, you, at least von Braun and some of the others had wanted to save the central files of Peenemünde.

HEIMBURG: Yes.

NEUFELD: You know, these are the ones that were buried by Huzel and Tessmann.

HEIMBURG: Yes.

NEUFELD: Why was Riedel and so forth, why was he out to make sure that the files had been destroyed, at Lehesten?

HEIMBURG: Each group had its own files, and only the central filing system was to be protected, as I understood it, and separate filing systems should be destroyed. This is how I see it.

NEUFELD: Why was that the case? I mean, I'm not quite sure what it would gain you, one way or the other, from doing it that way.

HEIMBURG: I think they tried to avoid that too many separate files fell into the hands of the American side.

NEUFELD: They were concerned that the bargaining chip--

HEIMBURG: Yes, separate bargaining.

NEUFELD: That they would have a bargaining chip of the central files that that not be undermined.

HEIMBURG: That's right.

NEUFELD: So that was the main concern in burning the files.

HEIMBURG: This is what I think was the reason.

NEUFELD: So you were told by, you say it was Rudolph who told you that the files should be burned at that location?

HEIMBURG: No, no, that was not Rudolph. You know, we had our command system Bleicherode, and we got from Bleicherode this order.

NEUFELD: Which goes back to before the surrender, then.

HEIMBURG: Yes. Yes.

NEUFELD: OK, so that was that. There was one thing you mentioned I think informally that we haven't talked about. You said that you had seen Mittelwerk once and it made an unpleasant impression.

HEIMBURG: Yes, very unpleasant impression.

NEUFELD: Do you want to talk about that?

HEIMBURG: The working conditions underground were very depressing. Let me explain it this way. And you immediately, when you see that, you ask yourself, how could you improve that? Could you? You come finally to the conclusion, no, you can't, because it is not

NEUFELD: So the tunnels were a very depressing working environment?

HEIMBURG: Yes, very depressing.

NEUFELD: Because they were cold or dark or damp or all of the above?

HEIMBURG: All of it. All of it.

NEUFELD: Did you have much direct encounter with the prisoners?

HEIMBURG: Not at all. Not at all. The only one I had a discussion with Schaufelen and I didn't even see Rudolph, while I was present there.

NEUFELD: OK, so --

HEIMBURG: And this visit was not even a must, but it was an interest, you should have at least seen that once.

NEUFELD: It really in some ways covered a massive area underground, did it not?

HEIMBURG: It did. A massive area. A massive area. You know, they had started out and had constantly increased that, constantly.

NEUFELD: And they'd added many other things there. They'd ended up producing jet engines.

HEIMBURG: Yes, right.

NEUFELD: V-1s and other things inside the facility as well, over time.

HEIMBURG: Yes.

NEUFELD: So you had gone back and essentially uncontrolled, from Oberammergau all the way back to Thuringia again, right.

HEIMBURG: Right. Right.

NEUFELD: And you had gone all the way back there, been contacted by the Americans, and you were then removed from there when the Americans told you that the Russians were coming in?

HEIMBURG: Yes, we were told, OK, we give you the OK to get out of that area to the western side, and the American army brought us to Saalfeld in the train. And the train brought us then to southern Germany. And there were quite a few who said, no, we want to stay here. But I gave them the advice, don't, don't, get out, get out. Well, how should our husbands know that we are not here any more but that we are in south of Germany? I said, "That is something which will be arranged, so don't worry about that, get out."

NEUFELD: You're talking about the wives of --

HEIMBURG:--for example, the air force people whom we had, they were in uniform, and since they were in uniform, they were taken as prisoners and sent into some detention camp, and how should they know where their wives are? And I knew that, I was absolutely sure, we get those people out of those camps and we did. And then we of course said, "OK, they are in southern Germany, they are not any more in Thuringia."

NEUFELD: So you were involved in encouraging other people to evacuate when the Americans evacuated.

HEIMBURG: Right. Right.

NEUFELD: Because I know that there was, in effect, for some people, they just were warned almost at the last minute. You hear these stories of, Americans came knocking on the door, said, "You gotta get out of here in 48 hours" or something like that.

HEIMBURG: No. We didn't have too many. I believe there were about five who didn't want to go out, and I contacted them personally, that, please don't. Get out. I convinced them.

NEUFELD: So you then went to ?

HEIMBURG: I went to Bleicherode from there. I did not go to southern Germany. I went to Bleicherode, and in Bleicherode, there was a transfer from Bleicherode which was occupied by the Russians too, then to Witzenhausen. ...

NEUFELD: OK, you were at Witzenhausen.

HEIMBURG: At Witzenhausen, and at Witzenhausen we put the group together which should go to the United States, and the first group was selected, I belonged to the first group of five, and we were sent to Frankfurt and brought into a camp. I have mentioned that to you before. And then, completely unknown to us, the British and the American side, the British requested that they wanted to see the launch of a V-2, and this was built up at Cuxhaven, and all of a sudden the five of us, we got the order, you go to Cuxhaven, and we met on the way to Cuxhaven another group, by the way Rudolph belonged to that group too, and we got vehicles which were partly destroyed and brought them into shape so that they could be launched, and I believe there were three or five launched, I don't even know any more. And then we went to Landshut and from Landshut we were shipped to the United States, and I was then at that time in the third shipment.

NEUFELD: Which was at the beginning of 1946 or something?

HEIMBURG: No, this was in November, '45.

NEUFELD: Did you question much the idea of going to the United States, or did it seem pretty natural?

HEIMBURG: It seemed to me natural, in this way. Here is a lost war. This takes quite some time until everything is reorganized. So you are better off when you are not in Germany but you are outside of Germany, because I knew the company in which I was in, they would have a slow start until they would work again. So I

figured you are better off if you are for one year outside, and we figured, well, probably one two years we will be outside and then we will come back, because the idea mainly was not to start a rocket business, but the United States was interested what were the rockets like, how far can you use them, what can you do with them. And we had even started our second stage for the V-2 at Fort Bliss. But it never came to bear, because after two years, you know, then, or three years, it finally was decided, no, the United States will go into the rocket business too, and we would stay there.

NEUFELD: So you went without any real intention of going on a permanent basis.

HEIMBURG: No, not at all. Not at all. I was fairly convinced after two years latest we would be back. But that was a personal opinion and everybody had a different opinion about that. But we all were convinced we won't stay there, we will go back.

NEUFELD: Yes. I'm not sure what von Braun thought, if that's true of him, but I got the impression that not everybody -- I mean, I'm sure there was a lot of question whether you would be able to stay.

HEIMBURG: Yes.

NEUFELD: It seems some people thought maybe they would want to start rocket development business in the United States.

HEIMBURG: I'm pretty sure, knowing von Braun, that he would like to stay in the United States and start again in the rocket business. You know, that was his hobby. There's no question.

NEUFELD: It wasn't just something that you had done during the war. It wasn't something he had done during the war, it was his life.

HEIMBURG: He had quite openly mentioned, it is a shame that we have to use it for war purposes, but it seems that to get further into development, we need to do it.

NEUFELD: Do you remember him specifically saying that?

HEIMBURG: Yes.

NEUFELD: At Peenemünde. When did he say that?

HEIMBURG: Uh, he mentioned that repeatedly, and I heard him say that, I think that was in '43. And I don't know if anyone told you that, you know, von Braun, Hitler was not convinced of the V-2, and since the war changed a little bit, he was approached by

Speer, and Speer then finally must have convinced Hitler that von Braun should tell him the story of the V-2. And Dornberger was the one who told von Braun, "When you come to Hitler, you keep your mouth shut about the possibility to go into space. Don't mention that. In the moment when you do that, he will throw you out, so don't mention that," and he did not.

NEUFELD: Where did you hear that story from? Because it's very--

HEIMBURG:--from von Braun, too. He told us that once.

NEUFELD: In the United States.

HEIMBURG: In the United States.

NEUFELD: I mean, it's very important for the historical record that you remember distinctly von Braun saying, during the war, at Peenemünde, that he wasn't happy that it was used for the military.

HEIMBURG: Yes.

NEUFELD: Did that strike you at the time as a trifle risky, for him to say that? Or was it done --?

HEIMBURG: It was very obvious to me that it was risky. And I was surprised that he mentioned that. But this was not a big crowd. A couple or two or three people or so where he mentioned it.

NEUFELD: You mean, in terms of private --

HEIMBURG: Yes.

NEUFELD: Private testimony.

HEIMBURG: Private testimony, yes.

NEUFELD: Private discussion and conversations.

HEIMBURG: Yes.

NEUFELD: Sort of social occasions or something like that? Or just inside the laboratories?

HEIMBURG: I think that was inside a laboratory meeting when he came by. Oh, I should tell you that story. It is again, not anything...

NEUFELD: As far as this anecdote, or the statements by von Braun, he said these only among a few friends?

HEIMBURG: Yes.

NEUFELD: About --so he wasn't too careless about who he made these statements to?

HEIMBURG: He was still. He was still, he was restricted, he did not say that to everybody. He told that to people that he had confidence that they would not misuse his words.

NEUFELD: Yes, because that's very important. People said that, but we have very little clear evidence, for judging his intentions, what he wanted, and his relationship to the Nazis, you know, we have to have this kind of information.

HEIMBURG: I give you one example...

NEUFELD: You were talking at the conclusion about von Braun, and we all know he had many brilliant aspects and talents.

HEIMBURG: Aspects and ideas. And I had once, was confronted with a problem, and I was aware you could do it three different ways, but I was not clear in my mind which would be the best one, so I thought, why don't you ask von Braun? So I told him, "I have a problem and maybe you can help me." He listened to me. Then he said, "Well, you make your own decision, and I tell you afterwards if it was right or wrong." Which was from his point of view absolutely right. "For that purpose I have you, why should I bother with such projects?"

NEUFELD: But that wasn't entirely pleasant for you.

HEIMBURG: No, not at all.

NEUFELD: You were afraid you'd make the wrong decision from his standpoint.

HEIMBURG: Right. That's right. You know, after the fact you always have it easy to judge. But on the other hand, you know, von Braun was really clear, too, look, this is your problem, this is not my problem, I have my own problems, you solve your own problems. And he expressed that more than once very clearly.

NEUFELD: But he seemed to know what was going on in every single area.

HEIMBURG: Yes. He did. What he did not like at all was, "Well, resolve that problem in a committee." He did not like to hear that. "You are responsible, not the committee, committee is never responsible, one man is responsible." And this is in my opinion a necessity, too, so that people cannot conceal themselves behind a screen --that's your responsibility. I work the same way.

NEUFELD: You think that you learned something from his management concept?

HEIMBURG: Oh, definitely. Definitely I learned a few things. As I have mentioned, when you work on the government side, do not come out with the real figures. You lose the project before you have started it. He had taught me that in Germany, and that was true here in the States as it was in Germany.

NEUFELD: His command over all areas, I know someone said that firstly he had command over all the different aspects, and secondly he talked to everybody from the top to the bottom. Right down to the mechanic.

HEIMBURG: He did. And that was something which some people didn't like at all, and I can understand that. You know, when you are for example head of the design, and he talks with the designer without your knowledge, and you come to the designer and you discuss it and you say, "OK, let's do it in such and such a way," and the designer tells you, "Von Braun told me differently." That of course is something you don't like, and you can say, "You, von Braun, when you make such a decision, let me know. Not that I learn that from a designer." You may have heard the name of Raithel. Raithel was head of the design for some time here, and he left because he couldn't stand that. ...So this was let's say, something you as supervisor didn't like if he did that. I didn't experience that so I could not complain about that, but Raithel told me that "this is the reason that I leave. If that only happens once in a year, you can stand that, but if that happens repeatedly--"

NEUFELD: What do you mean, he told one person one thing and another person another?

HEIMBURG: No, no, he told the designer how to do that, but he did not tell the boss that he had made the decision, and of course, when you come to the designer, you are being told "von Braun told me so and so."

NEUFELD: So this was one of the disadvantages of von Braun's management style.

HEIMBURG: That's the reason I mentioned that.

NEUFELD: He had many advantages as well.

HEIMBURG: Yes, right.

NEUFELD: OK. Thank you very much. «