

Interview with Sigurd A. Sjoberg at the Manned Spacecraft Center, Houston, Texas, 1100 hours, 28 July, 1972. By Robert Sherrod.

Interview with Sigurd A. Sjoberg, deputy director, Manned Spacecraft Center, Houston, Texas. At the Manned Spacecraft Center, 1100 hours, 28 July, 1972. By Robert Sherrod.

Q. Well, let's see. You were born in Minneapolis?

A. That's true.

Q. Went to the University of Minnesota?

A. Right.

Q. Graduated in aeronautical engineering in 1942?

A. True.

Q. Joined NACA the same year?

A. That is right.

Q. By golly, you and Chris have both spent your lives in this business, haven't you?

A. That's right.

Q. When were you first associated with him? At the beginning?

A. Well, I came to work at the NACA probably three years before Chris did. He came to work in the same organization I worked at, at Langley. That's where I first met him.

Q. That's right, he finished ...

A. I think it's probably '45.

Q. ... finished school. He told me last night he went to work in January '45.

A. That's about what I remember.

Q. There are a lot of people around here who've never done anything but work for NACA or NASA. Well, Faget's one, too.

A. That's right. Faget. Dr. Gilruth, I think, went to work for the NACA directly out of school. I know he did, as a matter of fact.

(036) Q. He also went to the University of Minnesota, didn't he?

A. Yes, he did.

Q. You never knew him before you went to NACA?

A. He graduated before I started . Deke Slayton's from the University of Minnesota. And Phil ~~Litvak~~ ^{Witbeck} is. Quite a few of them. *(Witbeck is MSC director of administration and program control.)*

Sjoberg telephoned correction

Q. It's an amazing state. I was talking to Eric Sevareid about this recently. Well, the two men who were contending for the Democratic

/presidential/ nomination both came from Minnesota. McGovern and Humphrey.

A. Is McGovern from Minnesota, at one time? I didn't know that.

Q. No, I've got it a little bit backwards. Both were born in South Dakota-- Humphrey, and McGovern was, too, of course. All you Swedes up there got ambitious and left Minnesota.

A. Well, I'm glad I don't live there anymore.

Q. Don't you like cold weather?

A. No.

Q. Well, after you came to NACA ... well, you had about 15 years there before the space task group was formed. What did you do mostly in your NACA days?

A. Well, I was in the stability and control work in airplane flight testing most of the time. I spent some time out at Edwards working on research airplane program. But most of the work was concerned with flight research in the stability and control area, including automatic control systems and fire control systems, that kind of thing. Flying qualities of airplanes, developing fine qualities requirements and specifications. I don't know how many airplanes I've been associated with testing, but a great number of them.

(060) Q. You're not a pilot yourself, are you?

A. No, I'm not a pilot.

Q. And Chris isn't, is he?

A. No.

Q. It's always amazed me how many aeronautical engineers never actually flew a plane.

A. That's right.

Q. You'd think that'd be the first thing they'd want to do. Gilruth isn't either.

A. No, he isn't.

Q. Then, when the space task group was formed, did you go with it right away?

A. No. When the space task group was first formed it was mainly people from flight research division at Langley and from the pilotless aircraft research division. I was not allowed to go with the space task group when it was first formed, although I wanted to. There was a project going on that Chuck Mathews was running, and he went to the space task group. And they wanted me to run the project in flight research at Langley, so they wouldn't let me transfer over. I guess it must have been about a year, probably in October of 1959, that the decision was made that just about all the airplane flight research would be conducted at Edwards Air Force Base, and Langley essentially got out of the business. With that, the project I was working on was cancelled. It was at that time I transferred over to the space task group in the operations division which was headed by Chuck Mathews.

Q. Oh yes. Yes, I see 1959 was when you joined the space task group.

- (083) A. It's probably roughly a year after the space task group was started.
- Q. I see. Then you came to Houston with the first group that ...
- A. I came to Houston in February of 1962. I was the first man from the flight operations directorate to move down here. It was my job to try to insure that the move went well for the flight operations people. At that time we hadn't flown the first manned orbital flight yet. That occurred in February of 1962, if you remember, and an awful lot of people were still involved in that, of course. We were a rather small organization at the time of flight operations. I think we were about 130 people at the time.
- Q. Who planned Building 30?
- A. Well, I think the person that probably had the most to do with it was a gentleman named Tecwin Roberts. He's a Welshman who presently is the director of networks at Goddard. It was Tec who was given the job by Chris of really establishing the detail requirements for the control center. So, I think if you had to single out one man, he would be the man--at least the one I would single out.
- Q. He's just relieved Ozro Covington?
- A. That's right.
- Q. I was surprised that Ozro is down here now.
- A. That's right.
- Q. Well, I've been promising three years to visit Ozro out at Goddard. I got out there for a meeting one day, but it's the only time I've been there. He was going to show me around, but I guess I'll have to get another guide now.
- A. Get Tec Roberts. I'll call him for you if you'd like me to.

(106) Q. Alright, fine. I'd like to get out there one day, because this is a thing that's completely Chinese to me--I mean the Goddard operation; it's so far beyond my comprehension.

A. Well, they have a lot of quite interesting things there you can look at. You know, they have essentially all the equipment that you have at a remote networks station. You can see the workings of the whole thing, including the antennas and what-not. Let me know if you want me to call him and I will.

Q. Alright, fine. I don't know just when I can do it, but, as I say, I've been trying to do it for three years, and haven't done it. But before I go out there I would appreciate your calling Roberts since I know Ozro but I don't know him.

A. You probably met him. He's been down here for some of the flights. You might have met him in the control center some time or other.

Q. I might have. It's amazing though how many people I don't know. I don't know how many years it would take me to get to know them all. Well, let's go to Apollo 13, which was your first mission as director of flight operations, wasn't it?

A. That's right.

Q. And a most unusual one it was. By the way, I had always thought that Glynn Lunney was the flight director during the crisis, the Apollo 13 crisis. But I'm told that it was Gene Kranz during the most critical times there.

A. Gene Kranz was on duty when it happened. I can't remember the exact timing. I could look it up, of course, but it was some two or three hours after the explosion occurred--things were still pretty hectic--when Glynn

(131) came on duty. Gene had gathered together a group of people that really went away and tried to develop the emergency procedures that would have to be used to get the guys back home. So, there was still a lot of activity going on, in terms of transferring the crew to the LM and activating the LM and all of that kind of thing, when Glynn was on duty.

Q. So they would have to divide the honors, you'd say then, rather than ...

A. Well, Milton Windler played a part there, too, you know. I remember--I can't remember the exact timing, it must have been like five or six hours after the explosion--we made a mid-course correction to get back on a free return trajectory. And to the best of my recollection, Milton Windler was on duty at that time. But if you had to single out the two, I guess it would be primarily Kranz and Lunney. But Milton was quite active there, too.

Q. The period of crisis was ... or the period when you didn't know whether you were going to make it or not was, what, five or six hours, or how long was the issue very much in doubt? Do you recall that?

A. Well, let me answer your question a little bit differently. I think immediately after the explosion occurred--we didn't know it was an explosion at the time, of course--we saw all kinds of data that, if it were true, we knew we had a real emergency on our hands. In the first few minutes, of course--as you always do in that kind of situation--was making sure that the data you were looking at was indeed valid data. We had been having a few communications problems about the time the explosion occurred. Once we were sure we were looking at true data, it was very obvious then that we had a real problem. We did not know the extent of the damage to

(161) the command service module, but, if you remember, the crew had reported a bang, in addition to seeing the data, that made the situation look bad, so we were pretty sure we had an explosion. After thinking about that a little bit, we were quite sure we didn't want to try to use the service propulsion system to come home with because we didn't know the structural integrity of the service module after what had happened. So, I guess I felt that if the LM were indeed alright, that we had a real good chance of getting back all right. We were tight on some consumables but unless we had some further problems with the lunar module I thought we were alright. I think most of us felt that way.

Q. I'm told that you never had an exact simulation of this emergency.

A. Oh, no. We tried to simulate things that we consider not high probability but some reasonable probability of happening. We had redundant systems for the fuel cells and so on. We just never would think that we would have that kind of thing happen. I should say, though, that some work had been done in using the LM in a lifeboat mode as we used it that time, so that was not an unknown picture.

Q. I'm told actually it went back as far as 1962.

A. It went back quite a ways.

Q. Well, it's a very good thing it didn't happen on the way home.

A. Yes, indeed--or in lunar orbit.

Q. Yes. There's some argument about whether or not this condition that caused the explosion--that is, this switch being melted and causing the explosion--was unique to Apollo 13, that it wouldn't have happened on any other mission. Yet I've also heard that it could have happened on Apollo 8 or Apollo 10.

(193) A. Well, I think that if you'd had the same kind of failures in the tanks that you had on Apollo 13, it could have happened on any of the flights. I don't think--to my recollection--that there was a design change or that 13 was unique in that regard.

Q. Of course, you added another tank after ...

A. After 13, yes. So, yes, the system is different as a result of the accident on 13, but I think that the spacecraft, 13 and before, are pretty much the same.

Q. I remember seeing you on television when President Nixon came down here to pass out the awards. What do you recall about this awards ceremony?

A. Well, I recall that I was very pleased to be selected to accept the award for the whole operations team. I remember the wind was blowing like hell.

Q. Yes, your hair was in the breeze.

A. Well, I was thrilled--very simply. Still am.

Q. You didn't go on out to Hawaii with him, did you?

A. No. As I recall, didn't Dr. Gilruth ...? I'm not sure.

Q. I'm not sure. I know Paine did.

A. Dr. Paine did.

Q. And I think probably Gilruth did. I've forgotten. But it was suggested in Washington that Nixon was really avoiding the White House correspondents dinner that night, because they were giving an award there to Seymour Hersch, the reporter who exposed the Pentagon Papers.

A. I'd never heard that before.

Q. I think Mary McGrory wrote in a column in the Washington Star this was

(215) a great relief for him to be able to cancel the engagement for the White House correspondents dinner. And Merriman Smith, who was always the President's protector, the United Press man, had just died. As a matter of fact, he committed suicide on the night of the crisis, and when I turned on the news just before I went to sleep, the top news story was Smith was dead.

A. Was he ill?

Q. No, he was a man with a great deal of emotional strain. I think it surprised a lot of people that he did, because he had been the dean of ^{the} White House correspondents for years and years.

A. Yes, he always managed to close the conferences.

Q. That's right. "Thank you, Mr. President." He wrote a book called "Thank you, Mr. President," as a matter of fact. It was a great shock to me. I used to know Smitty very well when I used to be involved with politics. And they said on this news broadcast there's some trouble on Apollo 13 but it isn't considered serious. So I went off to sleep. I was scheduled to fly down here with Paine the next evening, but Dr. Paine left at two o'clock in the morning without me. He didn't have my home number. So I woke up about 5:30 and turned on the television and Jules Bergman had been on all night. ABC was the only network that stayed on all night with the crisis. CBS and NBC sort of ignored it. So, I grabbed the next plane, which was about eight o'clock, and got down here at the time. Paine's saying, "Well, I'm glad to know somebody got some sleep last night."

A. Well, I didn't get any. I remember I went home about seven in the morning and came back here about nine or something like that.

(237) Q. That's not enough sleep..

A. You know one thing I think we did right there was having that press briefing just about as soon as we could after the accident occurred. Remember back in the Gemini^{/8/} problem with the stuck thruster we didn't do that and I think we had a hell of a lot of criticism for it and perhaps justifiably so. I think the way it was handled on Apollo 13 was a lot better.

Q. Yes, and for the first time reporters were allowed in the viewing room at Mission Control. You know, two reporters at a time sat/in that little booth on the right hand side. I think/was a good move at that time.

A. I think it was, too.

Q. Well, Chris said something a year or two ago that I never have pursued, and I wondered what you remember about it. On the Apollo 11 landing, Chris said, "Sjoberg and I knew that Apollo 11 was going to land 20,000 feet down-range, but we let them talk us out of it." Do you recall that?

A. I sure do not. I do not recollect that, Bob.

Q. That's a direct quote.

A. When did he say this?

Q. Oh, sometime after Apollo 11, I've forgotten ...

A. No, I meant when did he say we knew this? Was it just prior to descent, or ...?

Q. That I don't remember. He just said we knew beforehand. I assume it was sometime before since the decision to land where you did had been made.

A. I don't recollect that.

(260) Q. You don't remember that? I didn't ask him about it last night. Just curious about it. By the way, do you know Phoncille Devore?

A. Yes.

Q. Last night I asked Chris about seeing the senior staff minutes. He said that nowadays there isn't much in them because George Abbey just keeps the minutes and just reports that so-and-so was discussed without saying a great deal about what went on. But in the days when Paul Purser was here apparently they contained a lot more information. I remember one thing that's in the Apollo spacecraft chronology for May 1, 1964. There was this little quote: "Shea reported that fast egress from the command module by the crew on the pad is not required." Now, apparently these NASA historians here had access to Purser's minutes, and I never have been able to get hold of them. And Chris suggested calling Phoncille Devore and asking her where these minutes were kept. She was Purser's secretary.

A. Yes, she was.

Q. Who's she working for now?

A. I don't know, I'll find out. Want me to?

Q. Yes, if it's not too much trouble. I must say that I would be interested in seeing anybody with such a name as Phoncille Devore. That's really a way out one. What do you recall about you and Chris recommending an unmanned ballistic Saturn V flight before the Saturn V had flown, before Apollo 4?

A. An unmanned Saturn V.

Q. A ballistic flight, not an orbital flight. I never heard about this until last night. I suppose I can look up the records on it .../garble/...

A. I'm having difficulty remembering.

(297) Q. I never heard it suggested. It seems like an awfully big site to fly a couple hundred miles downrange.

A. I can't imagine why we would want to do that.

Q. Well, Chris said he was in favor of it for a while. Of course, you don't know how long these recommendations last. But Apollo 4 was such a big success as it was. This is the one when a lot of people say, "Well, I knew we were going to get to the moon after we found the Saturn V would really work."

A. I . . . /garble/ . . . recommend that, Bob. I don't recollect it and I can't see the rationale for it.

Q. Well, I can look it up. Chris also said that you were the one who persuaded him--I suppose sometime during the Gemini program--that he ought to quit flight directing and become a manager instead of a man on the microphones. Remember that?

A. Yes, I do.

Q. When would it have been? Mid-way of the Gemini program?

A. Yes, either mid-way or toward the end of the program sometime. Something like that.

Q. Well, Chris said he was reluctant to give it up but you told him he ought to.

A. Well, that's right. I tried to talk him into doing that. I thought he ... /tape went blank/ ... In the Gemini program we were flying every two months and the Apollo program was coming on us with flights at frequent intervals.

And if Chris was going to be a flight director, it would have meant he would have had to spend a great deal of time in the control center. Because you can't

(322) be a flight director without spending a heck of a lot of time with simulations and that whole kind of thing. I thought his talents were needed on other programs and managing the whole organization, as opposed to being over there. And we did have people in the flight control division, like Kranz and Lunney and those folks, who could do the flight director job entirely adequately.

Q. Yes, it seems to make sense.

A. It just made sense.

Q. Well, I think he was reluctant to get off stage.

A. Yes, I think that's right. He liked the job a great deal. I don't think he has ever done anything perhaps in his life that he enjoyed as much. Because he kind of, you know, really invented the job and developed it into what it is. He did it alone and I'm sure he enjoyed every minute of it. It was a tough job, really---The whole concept of doing it.

Q. Yes, there were no precedents, were there?

A. None.

Q. Well, there are no precedents for a lot of things that have been done here in the Manned Spacecraft Center, aren't there?

A. That's true.

Q. You're plowing new ground. How are you on computers?

A. Poor.

/tape went blank/

Q. Sig talking to Frank Hoban in NASA headquarters, Washington. Has gone to check something. We will resume in a moment. Just before the end of the last tape, or maybe a minute or two after, he was talking about computers

(350) and saying that he is not an expert on computers although he has taken some lessons at IBM. We will continue on computers after he returns. It is now 1200 hours. ... Well, we were just talking about computers and you were saying that you were not an expert, you had taken some lessons at IBM.

A. I've taken a couple short courses at IBM. And, of course, ever since we got into this business it's been a very essential part of our whole operation, so I've worked with an awful lot of people who are very expert in the thing but I'm far from being one myself.

Q. Well, without a development of computers to a rather advanced stage, we couldn't have got to the moon, could we?

A. No sir, both from the standpoint of the airborne computers, or spaceborne computers, and the ground based ones. Also, I guess you could say from the whole planning aspect, too. You know, in terms of just planning missions and certainly a lot of the structural analysis that you have to do, it would be almost totally impracticable to try to do it.

Q. Yes, of course. Well, that was another place where you had to plow new ground, more or less. The computers weren't developed, were they, until NASA ...?

A. Well, certainly the space program gave great impetus to the development of computers and the computer programming. I'm sure it just provided a great, great impetus for the development of that industry.

Q. What else fits in that category of ...? What did we have to develop in order to get to the moon? Well, you had to master liquid hydrogen.

A. Well, the whole cryogenics, I think--hydrogen and so on. Certainly in insulation, and that kind of thing ...

Q. Of the cryogenic tanks, you mean?

(382) A. No, of the whole spacecraft--in terms of insulation, of lightweight insulations and insulations that are probably being light and very effective at the same time. Certainly in materials--titanium, for example, is a good one. The heat protection systems for entry. Well, I think in just about every technology you can think of is used in the space program.

Q. Yes, it was hard to envision ten years ago that all this could have been developed in such a short time, wasn't it?

A. Well, I don't know. Things in the technological sense are happening faster all the time, as you well know. I guess some of the greatest have been in the whole electronics area. So, I don't know if I was surprised, really.

Q. Well, you had to have an incentive in order to move that fast, didn't you?

A. Yes, indeed. Indeed we did. You know, I have the thought that just the words that President Kennedy said when he announced the program really provided a great, great impetus throughout the whole time it took to get that done.

Q. You were given a time frame that you didn't have otherwise.

A. Yes, a definite goal and the time frame in which to do it.

Q. Yes, and the money was forthcoming with which to do it. Yes, I suppose you aren't going to achieve a comparable thing for a long time to come--until we get scared again. Of course, the Sputnik scared hell out of people, and then the first manned orbit mission of the Russians provided the direct incentive to try to go to the moon, on May 25, 1961. Yes, it's too bad you can't always have the money and the time frame to achieve

(414) something like that. But a lot of people overlook that, I think. They overlook how awfully dark things looked like from 1957 to '61. Amazing.

A. Yes. I was over in Paris at the time Sputnik flew and there sure was some reaction over there, too.

Q. Yes. I can remember headlines being quoted from various European newspapers that the Russians have demonstrated their superiority to the Americans in technology.

A. And you know, as late as ... I think it was the summer of 1968 ... I was over there, too. I'm a member of the Astronautics Committee of the Federation Aeronautique Internationale. I was at a committee meeting over there and there was a Swiss gentleman named Fred ^{Ferrari} ~~Ferre~~, who's ./garble/.. business over there also, and he was absolutely sure at that time that the Russians were going to beat us to the moon.

*Sjoberg
correction*

Q. Well, as a matter of fact, Lloyd's of London took a bet back about 1960 or '61-- Gee, I think it was something like £100,000 to £10,000, or something like that--that the Russians would get to the moon first. I remember when Apollo 11 flew, Lloyd's paid off that bet. Do you recall that?

A. Yes, I do remember hearing about some bet. I don't remember the amount of it, but I do remember something like that.

Q. It was something in that order. It wasn't peanuts. Great thing. Well, you've been associated with Chris Kraft a long time. What makes him tick?

A. Many things. I think one of his most outstanding traits is his ability to lead people. It's a very rare person who doesn't respond well to Chris. Of course, there are many things that go with it: he's smart, he's very dedicated, he certainly can express himself wonderfully well. I think his

(450) leadership capabilities are certainly amongst the best I've ever known in anybody.

Q. Well, he doesn't pull his punches, either. I've seen him in these CCB meetings when he's said to somebody, "You're nuts." He can be rather blunt, can't he?

A. Indeed he can. But there's nothing wrong with that. That's required, ^{, at times} as a matter of fact. Indeed he does, Bob. He can be very, very blunt.

Q. But he doesn't seem to offend people he accuses of being nuts--not for long, anyway. Not so far as I've ...

A. Oh, no. I think he's a very, very fair and square person. He also cares about people, I think, a whole lot.

Q. That was Gilruth's strength. Gilruth is not a very impressive looking fellow, he's not a very articulate fellow, and yet obviously he's achieved a great deal through some strength or other that isn't apparent to a lot of people.

A. Well, I think he has a technical wisdom that I don't think I've seen in anybody, or very, very, few, in terms of really understanding what is important and thinking things through on very broad matters--^[e.g.] is it technically feasible to go to the moon? I'm sure that he would never have accepted the assignment to do that without a lot of thought and understanding that it could be done, and having a pretty good idea of how to do it. That is certainly one of his strong points. I think that anybody who's worked with him ^{just} has/a tremendous amount of respect for his judgment, for his integrity, for his leadership.

- (485) Q. George Low told me a story about him once. He said during the early days of the space program/he had a clash two or three times with Wes Hjernevik, and Hjernevik irritated him terribly. Well, then Low or somebody put several recommendations for a man to handle the management jobs here. And Gilruth said, "Why isn't Hjernevik's name on it?" This man who had been so offensive to him in meetings. And George said he recognized that Hjernevik was a good man, despite the clashes he wanted him to come to work here. Did you ever hear that?
- A. No, I hadn't heard that.
- Q. George also said that Gilruth's ability to pick strong people was one of his attributes.
- A. I think that's true.
- Q. And certainly that's demonstrated that he did. He and Joe Shea, who, after he left, really became quite bitter against Gilruth. He told me one night that, "You know," he said, "The Manned Spacecraft Center is a fantastic place. Nobody down there wants anybody else's job." They all work in coordinated fashion without the usual bureaucratic backbiting that you find other places. Had this occurred to you also?
- A. Oh, yes. Very much so.
- Q. Because you don't find that attitude among people in a business or in a government department or anywhere else very often, so I've found. I wonder how Gilruth likes his new assignment? McCurdy's job.
- A. Why don't you ask him?
- Q. Well, I did one day soon after he got started. I saw him in an elevator in headquarters in Washington, and I said, "Bob, how do you like your new job?"

517) And he said, "It's challenging," which I thought spoke volumes. One thing about Gilruth that always occurred to me: he looks older than he really is. He really looks like the father of the Manned Spacecraft Center, doesn't he? Well, were you very much involved in the lunar receiving laboratory when it was being built and when it first started operating?

A. No, essentially zero. I was on flight operations and we had nothing to do with it. We were responsible for those mobile quarantine vans that we used in getting the guys back from the ship. We did have that job, but we had really nothing to do with the lunar receiving laboratory.

Q. Well, these vans worked out alright, didn't they?

A. Oh, yes. They worked fine.

Q. Of course, now, looking back on the lunar receiving laboratory, all this quarantining wasn't very necessary, was it?

A. No, it sure wasn't.

Q. But I suppose it had to be done.

A. Well, it was not something that we were pushing. It was a requirement that was levied upon us and we did our best to carry it out. The quarantining wasn't necessary, but some facility like the lunar receiving laboratory is certainly required for handling all the samples and the scientific analysis and chemical analysis of all these things, and so on. And trying to keep those samples from being contaminated by something else is part of the game, too, you know?

Q. Yes, I remember going through the lunar receiving laboratory two or three times before Apollo 11, and trying to understand these fantastic Rube Goldberg contraptions they have in there.

(545) A. You know, Dick Johnston had a lot to do with making that thing work.

Q. I know. I got a call in for Dick. I hope I see him this afternoon before I leave. Yes, I remember when he took over the thing, only two or three months before Apollo 11, I think.

A. Yes, he really had a crash thing going there.

Q. It was a mess, he said. Something I've heard expressed that I'd like to get your opinion on: somebody said that the Manned Spacecraft Center was too airplane oriented--that is, they were flyboy dedicated, in other words--/and/ that it would have been much better if they'd understood missiles better. And for that reason it was a good thing to have Shea and Mueller come into the program to counteract the flyboy attitude of the Manned Spacecraft Center. What do you think about that?

A. I don't think I understand what they mean by that. I can interpret it several different ways. I don't think we were too airplane oriented at all. If the question is because the astronauts are located at this Center and all the publicity they get from that kind of thing, that's a different question. But I don't think the Center was oriented that way. I think people could get that impression because of the astronauts being here, but I think that is inevitable as long as you had the astronauts and the fame they were getting at the time it happened. I'm not saying that Joe Shea and George Mueller were not assets to the program, because they're both extremely capable people. But I don't understand any flyboy attitude.

Q. I heard that expressed recently. Of course, it was given as one of the reasons why North American got the spacecraft contract back in '61, because Gilruth pushed very hard for North American. He was persuasive in swinging

(584) Dryden and Seamans and Webb over to North American, because they'd done such a good job on the B-25 and the B-51 ...

A. X-15, I suppose.

Q. X-15, of course.

A. Well, I think it makes an awful lot of sense, if you're going to build a spacecraft for men, that you ought to have a contractor who has some experience in building machines that men operate. I don't think you go to somebody who's never had that experience. That just makes good sense to me.

Q. I'll tell you a funny thing about that. Max Faget said to me once that he had suggested they use submariners--Max being a former submariner, you know--instead of airplane pilots as crews. And about four or five months ago I was reading a Russian book about the cosmonauts--I think it was called "The Russians in Space," or something like that--and the same thing was suggested to the Soviets, too. But they got no further than Max did with his suggestion. Very funny. Remember once you said to me, on the 16th of May 1969 ... I hope you don't mind old words being brought up and put back in your mouth. It was after Paul Haney departed, and you mentioned at the time that Gilruth wanted to get rid of Haney, too--it wasn't only Julian Scheer. All the onus was put on Scheer. But what was wrong with Haney? You were here watching him.

A. Well, I hate to criticize people, particularly on tape, but ...

Q. Well, I'll turn it off. ... 12:30. Going to lunch. ... Now that we've come back from lunch, let's see how good the pick-up is on this thing. Mr. Sjoberg, you promised to come for dinner in Washington on Monday evening. I'll pick you up at 6:30 at the Georgetown Inn. Now, just say, "That's right."

(624) A. I'm looking forward to that.

Q. Fine. Well, we'll resume our conversation at that time.

A. Fine.

Q. I'll ask Chris if he can come along, too, and we'll grab somebody or other. ... So, at 1400 hours I take my departure from Sig Sjoberg after an hour's interview, or a little more, and a nice luncheon at a seafood restaurant down on the waterfront.