

ORAL HISTORY TRANSCRIPT

ARNOLD W. FRUTKIN
INTERVIEWED BY REBECCA WRIGHT
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WRIGHT: Today is March 8, 2002. This oral history is being conducted with Arnold Frutkin in Bethesda, Maryland, for the NASA Headquarters History Office. The interviewer is Rebecca Wright, assisted by Kevin Rusnak.

This is the second half of this oral history. The first part was conducted on January 11, 2002. We are visiting with Mr. Frutkin about his roles with NASA that included his involvement with NASA policies dealing with ... the international community ... and federal agencies.

We'd like to begin today with some of the work that you did with negotiations with Spacelab.

FRUTKIN: Right. The Spacelab story begins, as near as I can remember it, with a number of talks that Tom [Thomas O.] Paine [NASA Administrator] gave in this country explaining his vision of the post Apollo Program. He talked in fairly ambitious, very ambitious, terms of a large space station. In fact, he described it as a one hundred-man space station. You have to remember that Paine, before he came to NASA, was head of a think tank at GE [General Electric Company], and he was a strong member of the Futurists Group. So he thought in these rather large far-out terms. He was pretty good at sketching that kind of thing, and it attracted a fair amount of attention.

He gave that talk at one time when Herman Bondi was present. Herman Bondi was president of ESRO, the European Space Research Organization. He was, I believe, a Nobel

Laureate. [You] can check on that. He was a physicist, and a very bright and energetic man [and co-author of the Steady State theory of the universe]. He was much impressed with [Paine's] talk, not in terms of its literal specifics, the hundred-man space station, but in terms of there being a follow-on to Apollo that would be quite elaborate and involve a space station of some sort. He met with Paine after that talk and expressed interest in the European space [agencies] getting on board in some way, participating in some way.

I was present because he was an international guy, and Paine asked me how we could begin to lay the groundwork for European participation. So I suggested we take his talk, that he go abroad, and we talked in those words—of a dog-and-pony show—that would go to Europe, go to several of the capitals and lay out what he had in mind for follow-on programs, and invite European participation. Well, we did that. We structured a fairly elaborate dog-and-pony show.

I remember John—who headed the manned space program for quite a while and got the shuttle off the ground.

WRIGHT: Mr. [John F.] Yardley? Was it Mr. Yardley, John Yardley?

FRUTKIN: Yardley. Yes. Yes, right. John Yardley, I'm quite sure, was a participant. There were several people, probably Homer [E.] Newell. I really don't recall. And I was there. Each of those people laid out his program area, and I laid out the sort of terms under which they might participate. I had talked with Yardley, I believe, and whoever was involved on the program side, and gotten a pretty good feel for what they felt would be acceptable and useful. So we talked in terms of doing some coherent element of a space station which could stand pretty much by itself and then be integrated, so that we wouldn't have too many interfaces.

That dog-and-pony show played to very large audiences in Paris [France]—I remember Paris. I'm sure we went to London, and I don't remember where else, but we went to several places. There was a great deal of press attention and a great deal of talk in Europe, and the Europeans got together and cooked up some proposals. Now, here I'm a bit fuzzy, because I think that there was a strong interest in Europe at that time in doing an upper stage of the launching system, and that presented some difficulties from the U.S. side, not just in NASA, but in the science advisor's office. There was a general reluctance at that time to get the Europeans involved in propulsion. So there was a fair amount of to'ing and fro'ing.

We had to steer their interests to some extent, and it eventually emerged in doing the Spacelab. It was to be a complex platform, what actually emerged, and the agreement we drafted for it had them designing a Spacelab in concert with the appropriate NASA people, building it entirely at their expense, but it then becoming, in effect, ours, because we couldn't have any veto power of the use of it. They would be able to use it when they wanted to by arrangement with NASA. They would have to pay for its launching, if they wanted to use it for their purposes exclusively. If a cooperative use was worked out, they would not have to pay for it.

But in any case, it was a very favorable agreement from our standpoint. I think there was a little grousing on the European side that maybe we drove too hard a bargain on that, but it was subliminal. And that's how the Spacelab came about.

Do you have any questions on that at all? That's how it came about.

By the way, when we went abroad in that dog-and-pony show and heard Paine's first speech in which he repeated this hundred-man space station business—and remember, this is back in the [nineteen] seventies some time—it would be an extravagant notion today. It was more than an extravagant notion then. When we heard him repeat it [then], Julian [W.] Scheer,

who was along, and I went to Paine, who was a very approachable guy whom you could talk to very well, and said, “Tom, you’ve got to knock that off. No more talk about hundred-men space stations, because we will lack credibility here. People won’t believe we’re serious.” So he was very good-natured about it and he dropped it, talked about a space station and what it would do. That showed something about that administrator.

Okay. What would you like to do next?

WRIGHT: Well, about Spacelab. Were the Japanese also involved? Were you negotiating with them as part of any of that?

FRUTKIN: No. It was with the European Space Research Organization. We negotiated through them. We could just segue into the Japanese if you like, because up to that time, the Japanese had been very much laggard in cooperation with us. I don’t think the Japanese were really interested in cooperation. I think they were much more interested in developing their own space program and space capability, and so they focused a good deal on propulsion.

There were actually two groups in Japan. There was one, a propulsion group, headed by Professor Itokawa. He had developed what was called the pencil rocket, a small solid propellant rocket, Japan’s first effort in rocketry, and he wanted to escalate that work into a major launch vehicle. And there was another group, ... university professors, who were interested in research, scientific research. They had some pulling and hauling between them, because they were competing for attention with us, to respond to them, and they were competing for money in Japan.

There were people who wanted to build a Japanese satellite and have us launch it, and we were interested in Japan joining the group of countries that had done that kind of thing. Itokawa and his friends were interested in getting access to Thor Delta [rocket] technology, and that led to some difficulties. They actually submitted proposals for access to Thor Delta technology, saying that would be their cooperative interest. We explained that was not cooperative, because, in our view, cooperation required joint or mutual interest. We had no interest in their working with Thor Delta. And, of course, we were reluctant in those days to provide access to launch vehicle technology. Not that NASA was, but we were under marching orders—guidance—to discourage that.

Things got quite interesting there, and I don't know whether this is general knowledge—I doubt that it's general knowledge—but there was in the State Department a very senior official, Alex Johnson. He was very much interested in the Japanese interest in launch vehicle technology and tried to encourage us to be more forthcoming to them. Now, in my opinion, he should have known a lot better, because he was a member of the little intelligence group, an interagency intelligence group, that would have known far better than I did that the U.S. was not interested in Japanese access to launch vehicle technology [at that time].

But here I'm going to just add a footnote of mine because I think it's relevant. He was married to a Japanese woman. He had been ambassador to Japan previously. So I felt, and I believe that others felt, he had a particular slant. I resisted it as strongly as I could, but he was a much more senior guy and, in my view, it was one of these cases where a man was advocate, judge, and jury. He was an advocate here and he took the Japanese interest before this small interagency group, which had Defense and C.I.A. [Central Intelligence Agency] and State and other representation, and pushed pretty hard for it.

What came out of it, as I remember—but you may want to check this—is that there was a commercial arrangement between the Japanese and the Thor Delta manufacturer. NASA had nothing to do with it. We opted out. But I believe that there was access ultimately given to the Japanese through that channel. Before it was [approved], the Japanese asked us if they could borrow a Thor Delta to display in Japan, and we just laughed at that idea, I mean, it was so transparent.

Okay. In the course of that history, I don't know if I told you this, but if it's already in there, stop me. There was an elderly Japanese scientist named Kaneshige, who had been a quite good friend of Hugh [L.] Dryden's, and we became quite good friends. He had been involved in the Japanese atomic energy program—peaceful uses. He told me at one time during a visit here that Itokawa had misrepresented our attitude toward cooperation with the Japanese publicly and he sent me a Japanese newspaper—did I tell you about this?

WRIGHT: No.

FRUTKIN: The Japanese newspaper, *Asahi Shinbun*, which is their *New York Times*, ... had a picture of me on the front page. I knew nothing about this till Kaneshige showed it to me. It was in connection with a letter that Itokawa had written, stating as a fact that NASA refused to launch a Japanese satellite and using that falsehood as an argument for the Japanese developing their own launch vehicle. Kaneshige was identified more with the research scientists. He was opposed to Itokawa, and especially that kind of behavior, and so he was letting me know, I think, so that I could write a letter to *Asahi Shinbun*, straightening out that letter, which I did. But those things never catch up with lies like that. I'm sure there were Japanese who felt that we declined

to launch their satellites. In fact, we had been trying to encourage them to submit a proposal for a cooperative satellite. So that was sort of interesting.

A very similar thing happened, which I think is quite interesting, with the French. It had to do with the launching of communications satellites. This was after INTELSAT [the International Telecommunications Satellite Consortium] had been established. You know what INTELSAT was? Okay. As part of the INTELSAT agreement, the signatory countries all promised not to launch any international or regional communications satellites in competition with INTELSAT. The idea was INTELSAT would be a unitary global system, and they didn't want the members peeling off, setting up their own English system, their own French system, their own whatever, taking business away from the international system. And all the countries signed that.

Now, there were certain circumstances under which countries [could] launch communications satellites, I think for strictly national use, because that wouldn't compete with INTELSAT. There may have been some regional exceptions, I don't remember, but no international satellites.

France then came to us and asked if we would launch a communications satellite for them. That would not be a cooperative program because we had no interest in that, but it was a [purely French] program. They would pay NASA for that launch. We asked them to explain what this communications satellite was going to do. Well, it was going to be a research satellite, no commercial application. So we said, "Okay."

Then some statements began to appear in the French press by French officials, telling the French people that this satellite would, in fact, after a research period, be used for commercial purposes internationally. The State Department got very disturbed, properly, and asked us to get

a reaffirmation from the French of their pledge to INTELSAT that they would not launch a satellite for commercial purposes, impinging on INTELSAT. I was reluctant to do that that way, because I felt they had made their pledge, and it would be sufficient to say, “Hey, these statements are being made which are inconsistent with what you’re agreeing to do here. Are these people speaking with authorization or without authorization?”

Anyhow, it’s a small issue in the end, but State insisted we write the letter. So I did write a letter to the French and asked them to reaffirm their pledge. I, frankly, don’t remember how they answered the letter. I don’t remember how they answered that letter, but what happened was that a number of people in the French space program, one in particular, a man named Lebeau in the French space program, put it out in France and throughout Europe that we had refused to launch a French satellite when, of course, all we had said was, “Clarify the pledge you’ve already made and we’ll be glad to launch your satellite.”

So it was grossly misrepresented, and I was so angry about it, I refused Lebeau access to my office. He was not allowed to come to my office at NASA. Since that office was a very important point of contact for European space interests, this was quite a thing. And the French science attaché, Lévy—I forget his first name, very nice guy— Lévy came to me and pleaded with me to forgive Lebeau, and I said, “I want a flat apology from him.” He was a person I had grown to dislike. I discovered that he was devious in many other contexts. In fact, years later, he became director of a museum in France and got into a great public feud with a woman who maybe ran that museum or something, and was forced to resign. He got himself disgraced.

But, anyhow, that canard, that false representation that we had refused to launch a French communications satellite, was bruted all around in Europe and I had to respond to it. I mean, I would go to a meeting in Europe and somebody would say, “Why did you refuse to do that?”

And I would have a copy of the letter with me, because it was such a common thing. And we never fully caught up with that. That covers another story with the French.

There is one other related story, talking about other countries' interests in launch vehicle technology. Somewhere in the sixties, before 1966, I don't know exactly, but I know it was before 1966 because one of the people involved, an Indian, was killed in a plane crash, an Air India crash into Mont Blanc. His name was Homi [J.] Babha. He was a great figure in Indian science and generally in the world. He was a member of the Royal Society and the National Academy of Sciences. He was a fine man.

Anyhow, in that period, we had a sounding rocket program going with India, and they expressed interest in access to Scout technology, and we raised the issue in government agencies here, how we should respond to that. There was a debate, because some of the people who were well up on solid rocket propulsion, like the Jet Propulsion Lab people, JPL, we got them in on it and asked their opinion, and they said that the Indians could develop this themselves. It would be no great deal to do it. It might take them a few years, but they could do it.

There were others who said we should deny it to them because one didn't know how they would use it, whether it was going to be space research or for military applications. And we couldn't decide a question like that.

At one point, the head of the Indian program, Vikram Sarabhai, and Homi Babha came to my home to try to talk me into helping them to get access to Scout technology. Well, my personal belief was—and I said this in our own interagency meetings and so on—that they were going to get it ultimately. If we didn't help them, there were others who were going to help them, the French in particular. The French were developing their own solid rocket technology on their own, and they would be eager to help if we didn't, and others might help.

So the Indians would get it and, in effect, they would get it over our dead bodies if we refused to give it to them, and so they'd resent us. I thought it would set back relationships because it was important to them. I recognize that you'd be giving it to them sooner than they might get it otherwise, but maybe only a year or two, because there were others in the wings waiting to help. In any case, the decision here was not to help, so we said no. The French did help.

When I visited—I went to India often—they showed me what they were doing. There was a filament spinning technology which is used in the casings of solid rockets and—god, I haven't thought of that in thirty years—and they were working with that. They'd gotten it from the French. Then there is the casting of the solid propellant itself. They've gotten into that.

Then, I remember, one of the critical items of technology that they needed in developing the rocket was a shake table. They're these very large structures that I think ... are designed to simulate the high-vibration regimen in the launch phase, and they shake rockets to see what they—they have to be built to withstand that terrific vibration. They applied to get shake tables in this country, and I'm quite positive they were denied, but they did get them from somebody else.

So I mention this because it's part of the history, but it also illustrates that there is a real question. I won't presume to answer it, but there's a real question whether it pays to stiff people who should be your friends in matters that are futile, because you could not keep the Indians from getting launch vehicle technology of that primitive kind, the scout-level thing.

I don't know how significant that was in U.S.-India relations, but they were terrible at that time. Mrs. Gandhi was the prime minister and very anti-American at the time. For part of that time, the New York senator who's just retired, Pat—

WRIGHT: Moynihan?

FRUTKIN: [Daniel Patrick] Pat Moynihan was the ambassador to India at that time. I used to visit him whenever I was in India, and he would fume about Mrs. Gandhi. And she was a person whom it was easy to dislike. I met her a couple of times. She did not like Americans. But I have no idea how significant a thing like this was in that general problem with India. I suspect it was probably relatively minor, but more significant than most people would think because it was the sort of thing—you see, they undoubtedly were interested in getting technology for military purposes. So it would have been a big thing for them, for their security posture, so they might have felt a bit more seriously about it than we imagined. That's my guess. Anyhow, there it is.

Later, of course, the Indians did—I think they have put up their own small satellite, haven't they? I believe they have. It was after my time, but I believe they did. I'm sure they have. Right.

Now, you asked me about China.

WRIGHT: Yes.

FRUTKIN: Unless you have some more questions about any of this.

WRIGHT: No.

FRUTKIN: We were doing nothing with China. NASA was doing nothing with China in the sixties, the early sixties, because there was a deep freeze in U.S.-China relationships at that time.

I don't remember exactly when in the sixties the ping pong era began, you know, when we began playing ping pong with them, which was the first public evidence of a slight, slight crack in the thing, but we [in NASA] were doing absolutely nothing and it was not imaginable at that time that you could do anything with them. There would not have been any toleration of the slightest technological interface with them for satellite launching or anything else.

But when we come along to Apollo-Soyuz, by that time, the early seventies, you had [President Richard M.] Nixon and [Secretary of State Henry A.] Kissinger in the White House, and they pushed hard for us to do Apollo-Soyuz, and I distinctly remember coming back from Moscow [USSR] after we got the Apollo-Soyuz agreement signed [but] before the project began, just the signature of the agreement, came back to my office, and my guys said, "Well, now we can relax for a while. We've gotten that taken care of."

And I remember saying, "No, you can't. I want you to sit down and draw up a couple of proposals for space cooperation with China." They looked at me as though I was crazy. And I said, "I'll bet anything that one of these days, it may be a year or two, the White House is going to ask us for some proposals they could make for space cooperation with China. It's going to come, so you might as well work something up." And that had to be very specially tailored according to our judgment of the political realities. It had to be an arm's length kind of thing. The Chinese might do a satellite, but it would have to be something very benign, like meteorology. Another was communications, in order to get them communicating with the rest of humanity. So [I believe] those were the two things that I asked our guys to work up. [The second might have been an earth resources satellite data access for the Chinese—I'm not sure.]

In time, they worked up two proposals and we went over them and polished them up and filed them away. I don't know how long after that it was, but one day—this would tell you a little about when it was because [James C.] Fletcher was the Administrator—Fletcher called me into his office and he said, “This is very hush-hush, but the White House has asked me to come up with some proposals that might be made to the Chinese for space cooperation.

So I said, “Okay.” I went back and took these things out of the file and went up to his office and gave them to him. [Laughter] He almost lost his teeth. I mean, he was really flabbergasted. But that was quite a minor coup.

Now, I think that happened after Kissinger's first visit to China. I don't think it was in advance of the first visit. I would be quite sure it was after the first visit, and it was for a return visit, and those [proposals] were taken over. There were no NASA people involved in that visit or the presentation to the Chinese. I suppose it was done very informally.

It developed very slowly, the response and so on. I was out of the loop by that time, so I never had any follow-on with the Chinese. That was done by others in the office. I know it was done. I mean, there were talks. As a matter of fact, I don't know whatever happened to them. My impression in the early year or two was that it was not going well. The Chinese were dragging feet or whatever. I don't know the problems. You'd have to talk to people who—like Dick Barnes might know. Do you know Dick Barnes? Do you know his name?

WRIGHT: No.

FRUTKIN: Well, he should be interviewed for this stuff, because Dick worked for me in that office from almost the very beginning through all the time I was there and beyond, and became

head of that office sometime after I left. It had all changed. It wasn't the same thing, but he was there, and Dick has a far better memory than I do. He would have been there when this Chinese thing was going on and, presumably, has known something about it.

I remember not being too well impressed with how it was going or how my old office was handling it. I had the feeling that things had slacked off quite a bit, but that's just a vague impression and it may not be valid. Dick Barnes would have a better feel for it than I.

So that's all I can tell you about the China thing.

WRIGHT: Would you talk with us a few minutes about Canada and, maybe, in specific, the remote manipulator system, the ARM, how it came about.

FRUTKIN: Oh yes. That's an interesting story. Did I tell you about the topside sounders? I think I did.

WRIGHT: I think so.

FRUTKIN: There was that very good, fruitful cooperation with the Canadians launching their topside sounder, ionosphere sounder satellites, at least four of them. I don't know whether that continued. But they had come up with a proposal that was better than ours. I think I told you. Okay. So I won't repeat that.

But they then came in—that's part of the Spacelab story. Sure. I didn't think of that. When [I said] we were talking with the Europeans about their participation in the Space Station Program, [I should have said] the Shuttle Program—the Shuttle Program. I earlier said Space

Station; it's the Shuttle Program. The Spacelab was for the Shuttle. When we were talking with the Europeans on that, the Canadians came in and said they'd like to participate, too. And as I recall, they had identified the remote manipulator, ARM, [Shuttle Remote Manipulator System (SRMS) or Canadarm], as something they would like to do. So we got them together with the program office, John Yardley's office. Yes, that's why Yardley was involved in that dog-and-pony show, because it was the Shuttle, not the Space Station. I was a little confused there. All right. It was agreed that they would work on the space ARM. Is that what we called it? Whatever.

They had done some work on materials with memory. See, the key to the—I'm getting mixed up. I'm getting mixed up. They had done an antenna. They wanted to do an antenna also, and I'm getting those two things mixed up. At some point they must have come in, wanting to do a very long antenna for one of our space vehicles. I don't remember which one. The key to that antenna was that a metal tape, almost like a tape measure, would unwind way out. I forget how long it was, but very long, and as it rolled out, it would curl up to make a tube, and it had teeth on the edges so it would lock into a tube, which would then hold its shape. It was a very clever business. So they did that for one of our space vehicles, but I guess that's distinct from the space ARM, which was a robot system with [manipulators]. They went to work on that and, as I understand it, did a spectacularly good job. It was very, very good.

Now, after it became known publicly that we had made this agreement under which they would build it with their own money and we would have it for our program—they wanted to do it as an exercise and as a sort of price of admission to the Shuttle Program—GE came in to see us. They were very upset because they wanted to do a robot. Well, we'd already made the agreement with the Canadians, for one thing. For another thing, we were going to get it free that

way and continue the congressional mandate to cooperate with other countries. We would have had to pay for it with GE. But GE said it was a technology that should not be left to be developed by other people; we should have it here.

There was a particularly aggressive and difficult vice-president from GE who came in with lawyers to see us about that, and what he alleged was that we had given commercial rights to the Canadians for this robotic ARM. Well, we had done no such thing, obviously not, and we had not precluded ourselves from also contracting for robotic arms in this country if we wanted to. And in fact, I read not too long ago, I mean sometime within the past very few years, that we have, in fact, contracted out robotic ARMs for space applications in this country. My impression was the Canadians were disturbed because they thought they had an inside track.

Anyhow, this GE lawyer said it was right in our agreement with the Canadians that they would have the commercial rights. Well, I wrote the agreement. I didn't have it with me. I hadn't looked at it in a long time. I said, "It's not there."

They said, "Yes it is."

I said, "Show it to me." So their lawyers began leafing through the documents. Of course, they couldn't find anything of the sort, and I remember Fletcher was delighted that we sort of trumped them there.

That GE vice-president, I think, did not last more than another six months at GE. He was a very difficult and objectionable fellow, and if he did all his business that way, you could see why they had dropped him.

Anyhow, that's the ARM.

WRIGHT: Also going on were some agreements being made for science.

FRUTKIN: For what?

WRIGHT: For science technology. You had some cooperative agreements with the Soviet Union for space biology and those types. Could you tell us how the science aspect was also included in part of your negotiations with countries or even industries here in the United States?

FRUTKIN: I can't tell you a lot about that. There was a life sciences cooperation with the Soviets. It focused mainly on man in space. The reason I can't tell you much about that is that we worked out the umbrella arrangements with the Soviets, and then there were joint working groups that got into specific areas, like meteorology, life sciences, whatever. I had probably least to do with the life sciences thing, because you had, on the Soviet side, the space medicine guy. That's what it really was, space medicine sort of stuff. The Soviet guy was named Gazenko. We didn't cover this before?

WRIGHT: We covered part of it, and I was just wanting to see if there was anything—

FRUTKIN: Yes. I know why we brought his name up. It was because we embarrassed them for their lack of cooperation publicly with a dossier. Okay. I won't mention that here.

On the U.S. side, I don't honestly remember who Gazenko's opposite number was, but they conducted ... meetings where [they] exchanged results with astronauts and cosmonauts, you know, how long [till] they recovered their land legs after flight and what the calcium/bone loss was and these things. They exchanged data on that. They seemed to get along very well

personally. I had no way of knowing how important those exchanges were. I think they just enjoyed the meetings.

Well, you know, this is a very murky area. When John [H.] Glenn [Jr.] flew a couple of years ago and the general rationale was that there would be a lot of really important medical information for older people, relevant to older people, I remember saying to my intimates, “Don’t hold your breath.” [Wright laughs] And so far as—I’m not aware of one item that’s come out publicly from John Glenn’s flight. Okay.

WRIGHT: Let me ask you, as you were moving along through the years that you were in this position, how your role changed and how possibly your office or program office changed before you moved on to your next role?

FRUTKIN: Fortunately, I don’t worry about such things, because it would not be a really good story. In my view, I’m now going to be talking about myself, so obviously it just has to be a personal view, and I don’t know how objective it is, but I think it was clear that my office and my personal role had constantly grown through the years I was in that job, to the point where some people had a grossly erroneous notion of how important I was at NASA. There were some people who thought I was much too important. The simple answer was, I wasn’t. I don’t think I was. But there were some people who thought so, and from time to time there were signs of some outside effort to cut me down in size. I didn’t know exactly where it was coming from for quite a while. It never amounted to anything, because I fortunately had, as far as I know, total support from every administrator up until [Robert A.] Frosch. So that takes you [from Glennan

and Webb] right through [Paine], Fletcher, George [M.] Low as Acting [Administrator]. Who the last one was before Frosch?

Now, there were some complaints about the program. That's one thing I had down to tell you about. I might as well tell you about it on the way. There were a few, very few, American scientists who, from time to time, grouched about our giving flight opportunities to foreign scientists. Well, you see, we were caught in the middle. Our mandate was to conduct a program of international cooperation, and it wasn't going to be a token program; it was going to be a meaningful program. It was going to be a real program. So foreign scientists were encouraged to submit proposals, not to me, but to the Space Science Office, and there they were vetted along with all other American proposals by the advisory committees that were set up for the Space Science Office.

There was one American scientist [Giacconi] in particular, whose name I cannot remember or I would give it to you, because I think he would deserve to have his name mentioned. I mean, anyone who's that nasty should be identified. But I can't think of his name. He was an experimenter and apparently a very good one.

One day, Newell called me and asked me to come down to one of his advisory committee meetings. I never went to those meetings, or very rarely. And it was because this guy was present, and he was complaining about our accepting foreign experiments and denying the space to American scientists. He was an experimenter. He had experiments on American satellites, but I guess he objected in principle. He had been objecting, and Newell, who was not a terribly gutsy person, wanted me to answer him, not himself, because these experiments had been selected by Newell's committees, not by me.

Okay. I explained that we had a congressional mandate, that I wasn't making the selections, that "You people are making the selections, your very committee."

And then I realized that this S.O.B., at that very moment, had an experiment of his on a Dutch satellite. The Dutch were accommodating one of his experiments on a satellite they were building with their own money and that we were going to launch, or was going to be launched by ESRO, the European Space Research Organization, I honestly don't remember which. But in either case, he was complaining that we were accommodating foreign experiments when he was a foreign experimenter being accommodated on a Dutch satellite. And I just gave it right to him between the eyes, and it ended that for a while. But there was a little bit of that kind of thing in the background. That was the only overt case that came up to that level at a meeting.

Now, this story is pure gossip, but it's relevant to your question. If I told you this one, you'd better stop me. One day Newell told me, while [James E.] Webb was still Administrator, that Joe Kaplan—did I tell you this? Joe [Joseph] Kaplan had come in to visit Webb. Joseph Kaplan was a physicist. He had done some work, when he was young, on [the] aurora. He had been chairman of the U.S. National Committee for the International Geophysical Year [IGY]. That's how I knew him. See, I worked over there before I came to NASA. I knew him, and we were very good friends. He was an older man and always came by to say hello and was particularly nice. He was a bit over the hill, but he was a very nice guy.

FRUTKIN: He came in to see Webb and, in Homer Newell's presence, he said that I ought to be fired because, apparently, some of this business of giving all these opportunities to foreign scientists and so on. Well, Webb laughed at him. Webb wasn't going to fire me.

Nothing ever happened from it, but the amusing gossipy part of this is that later that day I had a luncheon date at the Cosmos Club and I was over there and walking up the stairs when Joe Kaplan was coming down the stairs. And I knew he'd been in there that morning suggesting I be fired, and I thought it was a joke, because I knew Joe Kaplan. I said he was over the hill. He was a nice guy. He really liked me. He had been put up to it by somebody whom I know who said, "Joe, you've got to go in there. Frutkin's just too big for his britches." So I didn't take it all that seriously, and I felt quite secure in the job.

...He said, "Good morning, Arnold. How are you?"

[Without any forethought whatever], I said, "Well, Joe, I don't know." I said, "I don't know what's happened." This was just a spur-of-the-moment thing. I said, "I don't know what's happened."

He said, "What's wrong?"

I said, "I was fired this morning."

His face just collapsed. He was horrified. I mean, he was a nice guy. If he thought he would really get me fired, he would never have suggested it. He just said it to express an attitude, not really wanting to get me fired, I'm convinced. Anyhow, he passed on really disturbed.

And I went on, thinking, "What's he going to think when he learns that I was not fired?"

Anyhow, what that leads to is that I said that I felt I had a growing role, and an increasingly significant one, until Frosch. And the significance of it—I mean, by the time we negotiated the Spacelab thing, my program was bringing a great deal of cash—money, contribution—into NASA. The Spacelab, I forget how much it cost, but [many hundreds of millions of] dollars. I forget exactly, but it was a lot of money. And we would have been paying

for that ourselves if not for the international cooperation program and the four or more Canadian topside sounders and the robotic ARM and a big satellite like Helios, a big scientific satellite that the Germans did.

So the sum total of contribution through the program to NASA was very substantial. And it had another great significance: it stabilized programs. When it came to budget-cutting and stretching out programs, it was very difficult to do that with international programs. After you've made an agreement and gotten people to spend their own money on something, you couldn't just go to them and say, "Forget it." So it stabilized programs, and the program people in NASA knew that. They began to seek international cooperation because it became an additional argument for things they wanted to do, and it lent a measure of security to things they wanted to do. So it became really quite significant in that sense. I'm not taking personal credit for that, but the program had been put on very sound grounds, and I think that's why it grew so well. Nothing failed in it. Everything worked very well.

So it was a good thing, and I think my status grew with it. But there was this little bit of backbiting somewhere in the background. Now, when Frosch came in, I had known him very slightly because he was assistant secretary of the navy for R&D [Research & Development], and I'd met him socially. He called in the senior people, one by one, to meet them and talk to them and so on. He called me in. He started off by saying—he was very pleasant, but he started off by saying, "Well, I hear good things about you and bad things about you."

So I said, "Well, why don't we start with the bad things."

He said, "Well, some people think you're running NASA." Well, I mean if somebody came to you and said—what's the organization you work with? I forget.

WRIGHT: SIGNAL Corporation.

FRUTKIN: Yes. That you've got the CEO [Chief Executive Officer] of SIGNAL Corporation wrapped around your little finger—I assume you don't. Okay. All right. I mean, this was just absurd. So I laughed. I said something like—because I remember the scene pretty well. It was a new scene for me, not only at NASA but anywhere. I said—what the hell is Frosch's first name?

RUSNAK: Robert.

FRUTKIN: Bob. Yes. Bob Frosch. Right. “Bob,” I said, “I don't have a program. I don't have a budget. I'm running a staff office. I mean, I have nothing whatever to do with the science program, the Shuttle Program, the Space Station Program, nothing, nothing. I mean, whoever thinks I'm running NASA, speak to the previous Administrators.”

Anyhow, there were a couple of incidents which I think—see, I think Frosch came in having heard the same line that got Joe Kaplan in some years before to suggest I be fired and something else which will emerge in a moment. I think he'd been given a line and it stuck.

We very early took a trip abroad together, and I don't think he was prepared for the level of attention that my position got abroad, because abroad I was NASA, you see. And so people significant in foreign government, science offices, and in ESRO and ELDO [European Launcher Development Organization] and so on, and in the national space [agencies], treated me that way. And I don't think he was prepared for that. And they didn't know him at all, and I could see that [there] was an unfortunate [disparity] of exposures between the two of us, and I did all I could to put him forward. This is the Administrator and step back, and so on.

He had enjoyed the international activity he had previously, at Navy and in other places. Places I used to meet him were at foreign embassies in town. I just really think that he thought that there needed to be a change so that he wouldn't have to be working through me necessarily. I think he enjoyed working directly.

And at the same time, in that same new administration, the new science advisor was Frank [Press]. Frank [Press]—he had been the president, or later he became president, of the National Academy. ... I attended a meeting at which he met with people from the different agencies, and he asked each of them to tell about his program, his agency's program.

When he got around to me, I knew him somewhat, also from the IGY background. See, all of this came out of that. He said, "Arnold, tell about your program."

So I just gave a very brief description of the space program. and when I finished, he said, "That's your program, not NASA's program."

I said, "What do you mean? My program is NASA's program." And this was in front of a lot of people. I mean, it was the same line, you see.. These people had all gotten the same line from somebody outside—I know who it is, who it was. He's dead now. No point in arguing there. I remember, I did say to him, "Frank, I don't have a program office. I am a staff office, and I don't have a budget. I don't run NASA."

I called him and arranged for breakfast at the White House. He was a very nice guy actually, perfectly nice guy. And I said, "Somebody's got this thing very much wrong, the wrong end of the stick." But there was really nothing—I think they wanted to get me out of there, but on the other hand, they were dealing with somebody who had a pretty good reputation.

I've twice gotten NASA's highest award, NASA's Distinguished Service Medal, and the lesser award, the Exceptional Service Award [once]. The program was extremely well received

on the [Capitol] Hill when I testified annually about the program, extremely well received, because the congressmen thought it was the greatest thing in the world that we did all this without spending a dime abroad. It was un-American. It really was. And they [said], “Why don’t other agencies have programs like this?” and so on. So I wasn’t somebody you’d fire. I mean nobody could begin to say, “This guy is incompetent,” or difficult or anything. I had just the best of relations with 99 percent of the people.

So they kicked me upstairs, is what really was done. I was made an Associate Administrator ..., first Deputy Associate Administrator, then Associate Administrator, which was a higher level than Assistant Administrator, but it didn’t have the program content. It was understood—I mean, all the external affairs things reported to me, but I was not to have anything to do with international.

Well, I must say I’ve been very fortunate, because I was just simply not the sort of temperament to be upset by a thing like that. I always knew bureaucracy for what it was, always knew you’d have problems with specific people, and began planning my exit, which I [made], within two years from the time that Frosch came in.

My chance went to Detroit [Michigan], because my wife went to work for Ford [Motor Company], ... then Ford Aerospace, and then Lockheed—[v.p. at Ford Aerospace],... corporate vice-president [at] Lockheed.... But anyhow, she got a job at Ford and I got a job at Burroughs Computer then, now Unisys in Detroit.

Not long after I got there, Frosch showed up ...—must have been a couple of years—showed up with a job at General Motors, and the first thing he did was call me and invite me for dinner. So, I mean, I don’t know how you explain those things. You can do it as well as I can, but I’m just trying to answer your question.

Through the years—the answer to your question is, the role, I think, grew in content and significance and usefulness to a point until some personal—I think personal—hostility that I’ve located on the outside finally reached me. It made no difference. I should have left NASA before that. I was there too long anyhow. All that happened was I made [some] money in Detroit, stock options and things, so it was probably a good thing. I think that’s as candid an answer to [the] question as I can give.

WRIGHT: While you were there that almost twenty years, what do you consider to be your greatest challenge that you had to overcome?

FRUTKIN: That’s a very good question. That’s a very good question. There are really two. I’m sure my mind doesn’t work the way it’s supposed to. There are really two. One—I may be indiscreet here—one was dealing with Webb. In my first years there, the first five years, I dealt primarily with [T. Keith] Glennan and Dryden, and then Dryden. I did not normally go to Webb with my problems, I went to Dryden, and it was because I felt Dryden operated at a level that I respected a great deal more than I respected Webb’s operation.

I always felt there was something a little irrational about Webb, and I didn’t want to have to cope with it. But Dryden died in 1965, and so I then had to go to Webb. I never went to any of these people lightly, [only] when I had something substantive to do so as not to waste their time. But Webb was a complex personality, and I always felt I had to be very careful dealing with him.

There’s a interesting story that I have to tell. Maybe nobody else saw it that way, but when Webb first came to the agency—you see, Glennan was an [President Dwight D.]

Eisenhower appointee, then [President John F.] Kennedy was elected. Glennan sat around for quite a while waiting to hear that he was resigned or that he was continued or whatever. He was very upset. [The] White House paid him zero attention. Glennan was a gentleman, a real gentleman, and I think he expected to be treated as a gentleman, but nobody contacted him from the White House, and he was quite hurt by that.

He resigned, then we began to hear that the job of Administrator was being offered to a great many people. The word—I have no idea how valid it was—but the word was it was about eighteen or nineteen before Webb took it. Webb's impact on people, meeting him for the first time, [was] a thing because he was a highly charged personality. You don't meet people like that very often, so people had different reactions to it. I remember Dryden coming out of his room after he'd met Webb and saying, "I don't know what we've got here." Those were his exact words.

But anyhow, that was followed—we met Webb and he convened his first staff meeting. There were only about five or six senior staff members at that time. It was Johnny Johnson, who was the legal counsel, and myself and Abe [Abraham] Hyatt—I don't recall in what role he was, I think director of planning or something like that—and a few others, I'm sure the press person, that was before Julian Sheer. I forget who was the press person at that time. Somebody else.

So it was just a small group of us and we were staff people. The first thing Webb said was, "What would you all think of our having a NASA song, like the Air Force song?" Well, if you could have seen the faces of those people. I mean, it was just not NASA's style. We weren't eighteen- or twenty-year-old recruits to the Air Force. NASA consisted of older career people in the sciences and management and in administration and engineering, and it was grossly

inappropriate. Well, he just took one look at our faces and said, said something like, “Well, let’s forget that.” [Laughter]

And then he began to ask us questions about what was going on, but all the questions he asked us were program questions, and people just sat there. I remember I said, “Mr. Webb, you probably want to put those questions to the program people, because we really are not competent to answer them.” Well, it took him two or three meetings before he really got that straight.

Anyhow, see, now somebody like Abe Silverstein, who was a powerhouse, an absolute powerhouse, in my view and in a lot of other people’s view, he, with Dryden, is the man who put NASA together when it was established. Of course, he was an old NACA [National Advisory Committee for Aeronautics] guy, so he had a lot to start with, but they put together the new organization at the top, which was totally new, and it was the organization which, in effect, remained NASA’s strength for the first dozen years. They did a beautiful job, Silverstein and Dryden. But [after a] very few weeks with Webb, ... Silverstein asked to go back to Lewis [Research] Center [Cleveland, Ohio].

Webb was a complex and difficult personality. He was always experimenting with the organization and with people. He was always taking somebody who was doing a good job out of where he was and putting him into a place where he couldn’t do a good job. I could name people. I don’t know how many times he changed the relationship between the program offices and the centers. There are people who know more about that than I, but I know it was changed back and forth and back and forth, and always as though we were going off into the wild blue yonder. So I [obviously have] reservations about Webb. So that was one of the challenges. I had to deal with him.

He enjoyed putting people in a difficult position. For example, when Tom Paine was brand new as his deputy, his new deputy, there had been a previous deputy, Dryden. Paine came in and we had a staff luncheon. Webb sat at the head of the table. All the staff, program and staff staff, were present, maybe eighteen people at the table, or fifteen by that time, I don't know. Webb is at the head of table, and sitting right next to him at the head of the table was Tom Paine. I don't know how it happened, but Paine delivered himself of a rather long statement about what was generally wrong with our situation in this country. We had lost China, we had lost the Korean War, a whole bunch of things like that. We all listened to him, and he delivered himself of views, which were rather common views at that time. A lot of people would have agreed with him.

I'm sitting at the foot of the table. We could sit wherever we wanted. I was sitting as far away as I could. Webb said, "Arnold, what do you think of that?" Well, you see, that's experimenting with people publicly, and here was my new deputy administrator who just delivered himself of a bunch of things, not one of which I agreed with personally. They were just all personal views. I hope you can tell, I do not cover up anything. So I had a difficult little spot. That's why I say Webb was a challenge.

I had to tell the truth and not offend anyone if I could. So I said, "Well, I think you could make a very good argument for every one of the things that Tom said, and I think a lot of people would agree with him." I said, "On the other hand, you could make, in principle, a counterargument to every one of those things."

And for once I was very verbal. I ticked them right off. I said, "We didn't lose China. We never had China. The Russians have lost China. They were in there and they were thrown out. We were never in there and we were never thrown out."

“We didn’t lose the Korean War. The Korean War was fought to prevent North Korea from taking over South Korea, and they didn’t. They were driven back to their line. The Chinese invaded to help them do and couldn’t manage it. So we didn’t lose that war. I know its popular to say we did, but we didn’t.” Anyhow, I didn’t speak quite this way. But I went down through the list. I don’t remember what they were.

And Tom Paine was always wonderful to me. He gave me one of those Distinguished Service Medals. He was always wonderful to me, so I guess he did not resent the comment. But it shows Webb was a character.

WRIGHT: If we can, before we continue, we’re going to stop the tape and change out one.

[End of interview]