C. MICHAEL FOALE (Session 3)
July 31, 1998
Interviewers: Rebecca Wright, Carol Butler, Frank Tarazona

Wright: Today is July 31, 1998. We are speaking with Mike Foale. This is the third and final, as far as we know, sessions with him. Today we're going to be asking him a variety of questions.

We wanted to start by asking you about your preparations for going to Mir. We know that they included a lot of intense and diverse training. We know you have an extensive background in astrophysics, space flight experience that included three Shuttle missions. Looking back now, after being on Earth almost nine months, what skills do you believe served you the best while you were aboard the Mir?

Foale: The most important characteristic that I think I value in myself for that flight was the willingness to undergo something very different and foreign to what I was already used to. It was that trepidation, but interest, nonetheless, to get through it to go and do this strange thing that allowed me to be successful. I think it comes out of a person based on their backgrounds, culture, families, all kinds of things. I'm not sure it's something we could train into a person. However, I believe it's a characteristic of a person who lets them get something out of a really strange and actually quite hard experience. That was by far the most helpful thing for me.

A good example of that is that I was traditionally educated as a scientist. My interest in science started when I was very young. My interest in language, any language, even English, was minimal, and I put little effort into those subjects in high school or in college, and was not forced to either. Indeed, my approach to language as a useful tool to a person was fairly disdainful at a young age.

When I realized that I was going to be sent to Russia to do this job on the Mir, it was quite clear to me that suddenly language is a much, much more important part of this whole experience than I had ever given it that kind of priority in my life before. It was that cold realization that I was going to have a miserable time if I didn't learn the Russian language, it was an intellectual realization, that I then said to myself, in a fairly disciplined way, "You have to got to stop doing all those things you like doing in your free time, that you have been doing," such as physics on a computer, programming, hundreds of hours on the computer, reading science fiction in English. All those activities that I did in my free time as intellectual recreation, I was going to have to stop for the next two years. Instead, I only read Russian.

People have said I am a so-called gifted or I have a high aptitude for language. I don't believe that's really so. I believe it's because I made that decision to put those hours in, and I have noticed that's true of the other successful language students coming out of national office. Specifically, Charlie Precourt, and I think right now Ken Bowersox is going to be a star in language, too. These are people who look as if they're doing it easily, but it's not. It's because they're doing it at home, where they're reading a Russian book before they go to bed. It's that willingness to immerse oneself in the next project, or in this particular

case, the hard business of flying on an international, or in this case, a Russian station, that let me get through it.

The rest of it, as far as technical training, there's nothing unique in this that's different from the Shuttle system. The approach is a little bit more traditional book and college-oriented in Russia compared to all your visual aids and simulators emphasis that we have here in the U.S. But that's more a question of style between the two sides, not related to the individual entity.

Wright: You believe your common sense and reflex instincts, maybe even curiosity, helped the days be successful ones?

Foale: No greater than any other astronaut or cosmonaut. Certainly, astronauts as a group, I would go much further than that- I would say certainly most people who are interested in flying in space, or even working at NASA, already have that basic information and capability to do that stuff.

Wright: How much pre-flight training did you have in the medical field? When we talked to Mike Barratt, he made the comment that you're as good a paramedic as anybody he's met. In fact, he has the quote, he'd let you sew him up anytime. [Laughter] So I thought that was pretty much of a compliment coming from him. Is that something that you learned in preparation for these flights?

Foale: Yes. I should tell you that's one of the areas I found harder. I have never been particularly comfortable with actual operations on living animals. Not comfortable with it. It's not something I relish or enjoy, because I connect too much to the patient. [Laughter] So I have always had a problem, generally, with medical techniques, and I had to steel myself to learn those things, such as doing sutures and sewing things up, intubations for the case of choking and making holes in the trachea, for example, the various drug treatments and electric defibrillator techniques we use for heart attack treatment or other heart problems. All those things were new to me, totally, quite foreign to me as a physicist, but which, yes, I took seriously and tried to steel myself to do in a detached way.

Wright: Apparently, according to your teacher, you did well. Your commitment to language, do you believe that that helped with your adjustment to your new crews? Since you started out with one crew, but yet during the middle of your term there you got two new crewmates.

Foale: Yes, the answer is. Again, it's to do with this commitment to knowing the people with whom you're going to work with. The only way you're going to know them is to communicate with them. When it's a different language, the first thing you've got to do is to learn that language. Then you have to do all the

other things you have to do in the same language situation, which is mix with them, socialize with them, etc., and listen to them. So, language is first and foremost the enabling tool.

Interestingly enough, in the language lessons given by Russian language teachers, who are professionals, who teach Russian language to foreigners, and they are Russian, these teachers come out of a university called the Latrice Mamoomba University of Foreign Languages in Moscow, founded by [Nakita] Khrushchev to export Communism and the Communist principles of economics to Third World countries, in the majority. These instructors are now in their sixties, but they have a very long view of Russian foreign relations to the rest of the world through the students that they have taught.

Though they would teach me Russian in specific areas, such as economics or geography, from text that specifically were written in the Soviet years and are truly propaganda treatises for foreigners, I could read them and smile and they could read them to me and we would smile. We knew exactly that the meaning behind it was a different era, a different culture, even though [N.] Lenin was still on the wall staring down at me in the classroom. It was a different era.

They had such a broad perspective on how Russia had changed, as well as the Russian people were adjusting to the change, that the language lesson with those teachers, in particular, gave me a knowledge of a different culture that I would not have gotten but in a complete liberal arts foreign language course at the university. So for me it was like going through a master's program in the liberal arts.

As part of that, that naturally made me curious and made me able to relate to my cosmonaut friends. Actually, some of my closest friends are not cosmonauts in Russia, who are Russians. I relate to them also, especially the younger people in their thirties who are trying to make a living, keep their families going, etc. And that truly helped me. That's what made me see the positive things that are in Russians. If I hadn't done the language, I would have only seen negative things, because I would only see the difficulties with which I was dealing with the problem, being in Russia, being on a Russian station, and I wouldn't be getting anything positive back in terms of this cultural lesson in exchange.

Wright: As a follow-up to that, other than language, is there another piece of information or advice that you would share with people, that if they're going to work with the Russians, or even any other international project?

Foale: Well, see, it goes beyond. It's not just Russians. It's Japanese. It's Europeans. I mean, basically, an open mind and tolerance is pretty much the name of the game. "Do not be too quick to judge" is certainly the first thing you have to advise. And you have to learn to swallow something that is to you almost surely unpleasant, but smile, nonetheless, while you're swallowing it. That's a metaphor, but

actually when you go and eat another country's food, sometimes you'll be asked to try some foods that you really don't want to eat at all. But you've got to eat it and smile while you do it. [Laughter]

Wright: You didn't bring those recipes back home?

Foale: No, I didn't bring them home. I'm thinking of the little fish with the eye staring up at you out of the jelly for breakfast. [Laughter]

Wright: For breakfast? How was the smell, along with the taste?

Foale: Oh. It's in a little can, kind of wobbles there, and the little fish stare at you. [Laughter]

Wright: Did you find any foods that you liked?

Foale: Oh, yes, there's lots of foods. You can by, at least. I've never been big on caviar either.

Wright: I don't think I'm going to be too keen on tuna fish anymore now that I think about it.

Foale: But vodka is now my favorite drink, my drink of choice.

Wright: Did you have a chance to enjoy that while you were there?

Foale: Not on Mir, no.

Wright: No, not on Mir, but while you in Russia with your friends?

Foale: Oh, yes, a few times.

Wright: The social aspect of that culture, is that something that you enjoyed being a part of, or is it something that's done a lot, or they save special occasions for special events? Tell us about those times when you were with your Russian friends.

Foale: Actually, I'm overall disappointed with the degree to which I and my family integrated into Russian life in Russia. I hope that this is a sign of the early stage of our involvement with Russia in the joint program, but it was a barrier that was not created entirely by us, or maybe even 50 percent by me, because I've already said, I did have an attitude that let me try and cross that barrier.

We issued invitations on a number of times to Russians, ordinary Russians in Star City, to

cosmonauts especially, to come to our house, and they would not accept. It's a very interesting case here. They would not accept especially because of the first two or three Americans that lived in Star City, there had been complaints, general ones, that the living conditions were not the same as those that we are used in the U.S. So an effort was made, a sincere effort, by Star City management, the generals there, to provide new housing to American astronauts coming to stay. What it did is it created an island America. It created something, a little palace out on a field, where there used to be a rather beautiful park, with beautiful trees. That park was leveled and they put up what are now called the American cottages. And that was a park that had existed for like twenty years in Star City. People grow up in that town and they die there. I mean, generations go on. Space business is like a family business for most of those families involved. These towns don't kind of mix around in the Soviet times like we imagine here.

So what happened was that these little American palaces stood up. Actually, they're rather normal townhomes, by American standards. We were the very first family to be moved into them. I could see this danger when I go up there. I asked, why we, a family of four of us, were living in one hotel room for six weeks in the [unclear]. I asked if we could not move into an apartment along with the other Russian families lived. Even that apartment, by Russian standards, is luxurious. It's the sort of thing the generals have, but not the regular people. But what in the end told me, because I was new and I wasn't willing to press the point, but also, when I asked my Russian cosmonaut friends, who I'd met here, I said, "What shall I do?" They all, to a one, insisted that we stay in those cottages. They said, "No, don't try and live in an apartment. Live there. You'll be more comfortable."

What happened was that they had an impression as to what Americans needed. They said, "Oh, it will be too difficult for him. He can't handle the hardship like we're used to." So they advised, their own people, to put us into those cottages and we, Americans, if we didn't think too hard about it, said, "Yeah, I want the easy life." But as soon as that happens, you have created this little island America. For the Russians it is not comfortable. They cannot knock on the door and drop by like they do in the apartments. They don't see you in the hallway fumbling for your key and dropping it and trying to get into your apartment. You aren't having to smell the smells that they smell on the staircase going up to their rooms.

So there's immediately a barrier created. That was the intent by the initial Americans that went over there, to create better conditions, but it also created a barrier that couldn't be crossed. So I believe Americans have suffered more than the other foreign cosmonauts in Star City, as far as being able successfully to invite Russians to their houses.

Strangely enough, Rhonda and I did succeed in having totally Russian little dinner parties with three Russian families, all of whom were of the lowest ranks in Star City and were families we'd met in the

forest. They had already invited to us to their tiny one-room, not much bigger than a kitchen apartment, where three or four of them would live. We had been there, enjoyed their hospitality, and then invited them back. It was the reciprocal action. They were as nervous as can be to come into our house, terribly nervous. They were also terribly curious.

Those houses, for example, were used by couples walking around Star City. It's a pretty area. The forest is there and there's a little lake. Couples would walk around in the evening in the summer and have their pictures taken, because it was the nicest modern-looking Western thing in the area. They would get on our steps. We'd hear people coming up the steps, no one would knock, and they'd be taking their pictures. People would be taking their pictures or videoing them on the steps of our house.

We had old ladies, really old ladies, coming in, like seventy or eighty years old, coming in saying, "Well, I want to see the families that are living in this house." They imagined that four or five families would live in this house. She just wanted to call. She said, "Are you the"--what do they call them? The Russian was [Russian phrase]. "Are you the gateman?" whatever. I said, "We live here." She couldn't believe a family lived there.

Then we had an event where actually the house was broken into while we were gone for a period, by young kids from the school. It was mostly a curiosity thing, but there was also some resentment in the way they broke in. There was definitely some anger to these houses.

Unfortunately, I allowed myself, and I know I wouldn't have done any different, even the second time around, I allowed myself to be persuaded to move into those houses. Since then, as a potential housing crunch looms in Star City for new astronauts, I have told the astronauts who ask me about this, "Don't worry if they put you in an apartment. There is a lot of good to that deal." In fact, in the apartments, too, we've bought washers and dryers and things like that for them, which is way beyond what Russians have. So I mean, it's basically a pretty good life.

But that was a barrier that we created for ourselves and had to deal with the whole time we were there. Only when we had an official function, I never got my cosmonaut crews to ever come and have a party with me, except when it was an official function like when I was going away. When I was going away and I invited the whole base and all the generals and everyone else, then everyone came. But no one would do the typical Russian thing, which is two families together and have some wine and have a meal together. That has been achieved occasionally in the apartments. Only occasionally. Because again, still the foreignness of the foreigner prevents them doing that easily. But it's not so difficult if you are based in an apartment.

Wright: Of course, it's not difficult at all to get to know them up in the Mir, because it's the three of you

and you become very close.

Foale: Well, that's a different situation. That is quite different.

Wright: No barriers there.

Foale: Oh, there are barriers. There are definitely barriers of command and control. My boss is a different boss. The objectives of my program are different from their objectives. They overlap, of course. But more important than anything else, we all know as a crew on board the station--and I've seen this reflected by every long-duration crew member coming back--is that no matter how much we are different in our characters, how we wouldn't naturally get together in a bar or seek each other out on Earth, in space we are terribly respective of each other's privacy and very careful to not cause friction. I was truly impressed how everyone behaved very carefully not to irritate each other and not to offend. No one ever willingly offended, as far as I know. Yet those same people are much less careful on Earth, including myself. The space flight actually, because of the severity of the situation, forces a behavior change that is actually more civilized.

Wright: I guess that's the good news then.

Foale: That is good news.

Wright: The handover time is extremely brief compared to the time that you're up there. Did you receive any special advice from Jerry [M.] Linenger before the hatch closed and you were there? And did you have any special words for Dave Wolf as you let him and came back home?

Foale: Have you interviewed Jerry?

Wright: No, not yet.

Foale: Are you going to?

Wright: We're trying.

Foale: Okay. I'll leave it to Jerry to say what he told me. But for Dave, I was most concerned that he would come into a situation, living on the station, with false expectations. As I say, I believe most astronauts, in fact, most people working in the space program, once they're told if it's difficult or not, they can think about it, prepare for it, and deal with it successfully. But if you expect to go to a Hilton and you

find a little roach motel, you are pretty fed up and angry.

So I wanted to make sure that Dave Wolf understood that he was going to get into something pretty hard and pretty dirty, in terms of cleaning up water and moving equipment around, just doing a grungy job. So I sent a letter or two, actually to the one who he replaced, to Wendy [Lawrence], first. Then I had Wendy tell Dave what I had told her about what the conditions were like on Mir.

But the overall tone of my letter was that, "Though there was a lot of work to be done here that's hard, I still believe the operational lessons that we are going to gain at NASA working with the Russians and seeing how they operate a station that's been in space for eleven years are truly worthwhile. And for that reason, I recommend that the program send you. And, Dave, personally, I believe you'll get a lot out of it, in terms of personal award, in getting through this whole thing. However, day by day you may not think it's so easy or so pleasant."

I think he'll second that that's the overall impression you get. You're very glad you've done it, but it's like getting ready to jump into ice cold water. When you're out of the water you go, "Yeah, that was great!" [Laughter]

Wright: That first step. Do you remember your thoughts the first time that you saw the Mir from afar as you were approaching it?

Foale: Yes. Remember I've seen it twice from afar. The first time was like seeing the great wall of China or something from a distance. Or the pyramids. You don't relate to it. You know you don't have to live in there. It's like being a tourist in a bus tour. We flew around it on STS-63. We saw these people on it. We saw Elena Kondakova, with whom I was very glad to fly with on STS-84 later on. But there was Elena and these two kind of crazy guys waving to us, all excited. We didn't understand each other very well at all. I don't know Russian well. But we had Vladimir Titov on board, who could speak with them. We lingered there for about three hours. They invited us to tea. I remember I liked Elena's voice a lot. Then we went, "Bye," and left. So I knew what it looked like.

Since then I had gotten to know Elena very well, Kondakova, while she prepared to fly STS-84 to take me to the Mir. She had described how she had felt as we flew away without actually docking on STS-63, how disappointed they were, how wonderful it was and how unexpectedly beautiful it was when the Shuttle came up. but how really depressed they were after we flew away. I believe they had a big, big mood depression for a day or two after we flew away. In fact, that's true after anytime a Shuttle leaves after a docking.

So as we saw Mir, I already had a lot of feelings about it. I'd already seen it once before. I now

had Elena with me, and she was just as excited to see her old home. Charlie [Precourt] had already seen it before. So it was kind of like, yes, I've seen this before. There was nothing too unexpected about it.

As we got very close and docked, it looked overall in better condition physically than I had imagined. In the first days that we--in the very first opening of the hatch and travel down the hatchway into the Mir's base block, I was expecting worse and saw something better. I saw less clutter. No, I didn't see less clutter; I saw brighter, more cheerful objects, more visible things, than kind of the dull cellar-like impression I'd had in my mind.

I've mentioned this about Space Shuttle flight, too. Before my first Space Shuttle flight, I always thought getting into a Shuttle would be like getting into a dark, gloomy place and having trouble reading the displays, because it's so dark and kind of gloomy. Real Shuttle flight is not like that. It's like being on the 737 flight deck, light gray, sun streaming in through the windows, and it's great and there's blue sky. It was the same kind of contrast from what I expected, and then what I actually saw.

Going into the Mir living area, I was pleasantly surprised at the cheerfulness of the atmosphere there. It was kind of a warm, welcoming, cozy place, in spite of the masses of cables and equipment and wires that are on the walls. Nonetheless, it looked like a home. So that impression was kind of a mix of feelings, but colored also by previous experience.

Wright: Then when you left, that, of course, was the last time that you'll see Mir. How were your emotions then? [Foale laughs.] Well, you have to assume it's the last time that you're going to see Mir. [Laughter]

Foale: I'm sorry. [Laughter] But I had to say, as I saw the Mir going away, and we were doing a tremendous fly-around, it looked fantastic. I mean, all the guys around me were getting so excited about how great the Mir looked. It is truly a paragon, it's an ultimate in space flight experience to see such a big thing and fly around it. I was going, "Yes, we're getting away from that thing!" [Laughter] I honestly said, "I don't care if I never see it again." [Laughter]

Wright: I think anybody hearing you say that can understand why you felt that way.

Foale: I'll tell you right now, I laugh because I did say that to myself. I thought, "You know, it looks great, but I don't care if I never see it again." [Laughter] But if they asked me today to go back and do a short mission for a month or two there, I'd go. I would do it.

Wright: That's great.

Foale: It's kind of like why women have more babies after the first one, right? You forget how bad it was. [Laughter]

Wright: That's true, yes. Somewhere along we get smarter. The memory starts to get better. [Laughter] Or the kids get older, then there's other reasons why you have--

Foale: It was interesting, generally cosmonauts say the same thing. When they come back, when they're getting ready to come home, they say, "Never again. I will never sign up for this ever again." [Laughter] Then within a few, six months, they're going, "Oh, yeah, it was so great. Times were good. Didn't have any paperwork." [Laughter]

Wright: I understand that you're scheduled for STS-104.

Foale: Yes, the Hubble.

Wright: And a record number of six space walks are scheduled to be conducted.

Foale: Yes.

Wright: Do you feel the time that you spent on Mir and the experiences that you got there are going to be able to help you do what you need to do on this future mission? I know we've talked about the space walk that you did and working with people in space. I didn't know if there was any connection of the learning experiences there that you can take with you.

Foale: I believe what I can give to the Hubble flight is basically nothing extraordinary and not particular to my experience on Mir. I think I have a basic practical knowledge of spacesuits and EVA systems, broadened to some extent by the fact that I did an EVA in the Russian spacesuit, and also broadened a little bit because I did training in Russia and they have a different approach to training EVA.

But of all the EVAs that NASA does, Hubble is the only EVA scenario and the only flight that I truly got respect or felt respect coming from the Russians about what we Americans do in space. They generally discard Shuttle as just being too short, too frivolous, not serious. But when you talk about Hubble to a Russian, they sit up. They are impressed by the fact that we can do so many EVAs in such a short time and do them so intricately, and basically per the time line. This is something the Russians don't do, for good reasons. Good reasons. These good reasons are now trying to carry over to our side, so we don't try and do Hubble EVAs during Space Station. We must not do that.

So, therefore, knowing that what I learned over in Russian is actually the opposite, is the thing that the Russians know they don't do well and what they really respect, I'm prepared to only learn on Hubble. I don't believe I have an enormous wealth of experience to do Hubble particularly well compared to other crew members. So I'm going to go in there and I'm telling myself, "Mike, you can't approach this like you do a Russian EVA." With a Russian EVA or a station EVA, say, I've got some basic skills, I know how to go out. But I'm going to figure this out as I go along. I only need two or three times in the water tank to basically know what the structure looks like and I can do it, because, you know, if we don't get it done today, we'll go out in two or three days' time. That's the thing you can do on a station when you have six months to play with.

On the Hubble, you can't do that. You have got to go out today and do what you intend to do, otherwise you have failed in a specific objective. So, Hubble's a detail flight. It's where we have to pay attention to detail. We have to sweat little things that drive me nuts in ordinary situations. But this is a flight where you have to sweat the details. So I'm actually going to have to change my attitude and my kind of laissez faire approach, and concentrate much more on the task at hand. In that, I see a new challenge for myself on Hubble. So I can't just breeze in there and do it. So I'm actually looking forward to the challenge. It's truly new and different for me.

Wright: You survived the challenge of the Mir and you've been working with the program. You've never stopped working with the Shuttle-Mir Program since you've returned. Would you tell us what you feel are the benefits of the Shuttle-Mir Program?

Foale: Shuttle-Mir has its greatest benefit in that it drew the space professionals in both Russia and America together so they know each other and understand each other, and, therefore, can complete the International Space Station Program. That's the true value of the Phase One Program. The rest of it is all microscopic, I think, compared. We have learned a few technical things about how better to do space station. I'm certainly carrying over some technical lessons that I get quite emotional about, and as does Mr. [George] Abbey and the leadership here, that we feel that Space Station needs to learn a lesson from Mir, in terms of how to control its attitude in the event of power loss, what to do in certain cases if we have too much water condensation, but this is small stuff compared to the overall big win, which is we understand each other to the extent that we trust each other to do the International Space Station together.

Without Phase One, we couldn't do it. We would have to do Phase One. Phase One was an essential step. We'd have ended up doing Phase One-type flights on Space Station in a very haphazard way to get Phase Two done, you know, the International Station. Frank Culbertson said it a few times, that

without Phase One you couldn't do the Space Station. It's because of the way it's allowed managers, astronauts, engineers, all to know each other.

Wright: As we've been visiting with people, one of the common threads that keeps coming out is that there was an enormous amount of accomplishment made in a short amount of time with very few people, and most of them have always, they really enjoyed that fast, furious pace. Do you believe that is one of those character issues that someone has to be able to step right in and be able to run that fast? Was that something that helped Shuttle-Mir Program be the success that it was, that they had the individuals that are involved with it that made it happen? I think of the example that when you shared with us one of the last time, how you found out that you were going to be on the Mir. You happened to be in Russia and you just picked that up and you just went with it and went on. Most people seem to have that feeling that this is what had to happen. You couldn't take lots of time to figure out things. You figured them out quickly and you went on and made the program work.

Foale: I think you're right. But there's nothing particularly unique to the individuals. The Phase One Program and the astronauts and cosmonauts, and people involved in it, weren't specially selected and they don't represent a particularly special group of people at NASA and in Russia. They are people who have been thrust into a moment, into a set of external forces and conditions and have had to deal with it. It's basically an expression of, I think, overall fundamental flexibility that human beings exhibit when forced. And they really have to be forced to do it.

I, for one, I told you, I was very comfortable where I was. I had to go through some big, big mind shifts as to going into this whole thing. That's true of, I think, a lot of the people in the Phase One Program, starting with Frank Culbertson. He didn't want to be the Phase One program manager. I know that. [Laughter] This is a gloomy example, but it shows the strength of this characteristic in humans. When disaster befalls, true disaster befalls people, it's not as bad as we really say it's going to be. It's not all over. People pull out incredible things in the worst moments. It seems like we need the hard, bad moments to pull out the best. People are not heroes if nothing's going wrong. There are no heroes if nothing's going wrong. There are only heroes when things go wrong. And those people don't know that they're going to do it. It's a pretty fundamental, I'm glad to say, quality in human beings.

So a large number of people in Phase One have really felt some pretty big upsets in their lives, especially with travel, being away, feeling awkward and not knowing language, all kinds of situations that we've come across that ordinarily you wouldn't experience if you were just happily in your regular on the U.S. side of the Atlanta job.

Wright: We have enjoyed visiting with you. This is your chance, is there anything else that you would like to add for your history?

Foale: Well, I just hope that you're going to interview me again in about five, ten years, after what we've done on the Space Station and how we're about to go to the moon and Mars.

Wright: We'd like to continue that, as well. I was going to ask you what you're looking forward to, as my final question. So much is out there. Now that you've completed this, what would you like to do next?

Foale: I'll give you my big global picture of what's going on. The Cold War no longer drives the space program, probably never will ever again, even if the Cold War started up again. It wouldn't drive space like it did in the Apollo Program. However, a space flight, because of the Cold War emphasis on excellence and technological prowess, has created a little bit of a myth, or an aura, in the world's imagination that anything to do with space is kind of new, futuristic, the next thing, and good. I mean, in terms of pure value, I guess, whatever. So I think countries recognize now that by putting people up into space, especially when they're internationally grouped together, looks good to everybody, not just the people who are participating, but other countries around. They all admire what's happening. They're pleased. It gives people hope about humanity, as opposed to nations.

I think that basic idea is only going to grow. It started in World War II afterwards with the Foundation of the United Nations, which has masses of problems, as we know, but it has more figurative value than actual true power in its body. It's a shining beacon for the world. I think space flight on the International Space Station will continue, if only for that reason. It doesn't matter if there is no research, people will still want to do it, and governments will still put the money out for it. I won't name any names, but there is a number of governments that I can think of are doing it only because it shows that they are working with other nations.

If you take that argument further, as long as it doesn't cost too much for any one nation, yes, the interest will be very strong to go to the moon and then to Mars, but, I believe, only internationally. It will not be possible for this nation to do it alone, because the political will won't be there. The will will be there if it's with other nations.

So I think you're going to see International Space Station being like United Nations up, as opposed to East or West. [Laughter] From that you're going to see probably a joint mission to the moon to verify equipment that will then used to send a joint mission to Mars. I hope very much it won't just be Russia that will be our partner. I do believe Russia will be the other official partner.

Wright: For you, where do you want to be in all these plans?

Foale: Oh, I'd love to get to the moon. There's a chance, if I don't get too gray, we could get back to the moon in about 2003 2004, if we do a verification of TransHab on the lunar surface. TransHab's the habitation module that we want to put up. It's an inflated structure on the station. But it's also the core of a vehicle that we think should go eventually to Mars and be the Mars vehicle there. But we would test it out and its life support systems on the moon, and potentially put crew members in it for six months in lunar orbit, which is pretty far away from the Earth, in lunar orbit for six months and then land them on the moon and see what all the medical problems, etc., of landing did. It's only a six G, not a third G, which is what Mars is. But that's kind of the idea going around at the moment.

If all that demonstration works well, then go shoot for Mars in about two years after that. The ideas that Mr. Abbey has, Mr. [Daniel] Goldin has, the budget plans envisage asking money for that in about the next year. First significant money for that is the next year. It builds up to a lunar landing in about, as I say, about 2003, 2005. Then a Mars mission maybe five years after that.

Wright: How does this meet with your expectations of what you wanted to accomplish?

Foale: I would like to go to the moon. I'd like to go to Mars, but I've said in other places, right now I'd only do that if my kids were grown up and my wife could go with me.

Wright: Sounds like a good plan. Was this part of your plans when you originally wanted to become an astronaut, to venture as far as to the moon and Mars?

Foale: Oh, totally, yes. I thought I'd have done it by now. [Laughter]

Wright: Well, we're a little closer. So I guess that's what we'll keep working for.

Foale: I thought we'd all have done it by now. I remember I wrote a plan to myself as to how it was all going to go when I was about eighteen or nineteen. I thought sure we'd be going to Mars about now, yes. That when we were thinking that Shuttle was going to launch once every two weeks.

Wright: Maybe with all the cooperative efforts we'll be able to help each other.

Foale: Yes. It's much harder than that. Space flight is hard. You have to remember that a rifle that shoots a bullet at mach two, like an M-16, is a pretty good rifle, pretty good gun. It has a high technology

in the explosive charge driving that bullet. The Space Shuttle goes twelve times faster than that and it's a hundred tons. You then have to deal with the fact that you have all the radiation up there, you're isolated, you have no materials. This is a difficult thing we're doing.

It's because of that energy, specifically that energy of going up to twelve times the speed of an M-16 bullet, that really makes this thing both dangerous and so expensive. It's just to keep putting that much extra speed into it, with the same object, again and again and again in a short time, which is what liftoff is, is a very risky business.

Wright: But we certainly have people wanting to become part of the program. So the desire to be part of this program still lives on.

Foale: Oh, totally, yes. It's all across the world and the nation, across the nation and the world. I mean, lots of people. The trouble is, there's a very famous science fiction writer, who's since passed away, called Robert Heinlein. He wrote some of the very, very best books on young kids, sixteen-year-olds, eighteen-year-olds, wanting to become astronauts, becoming astronauts, whatever reason, however it happened, doing great things, saving the world, the galaxy, whatever. Very exciting stories. He talked about star travel, as well.

But I remember one book where the young kid who's just finished college is trying to get ready, because it's Space Academy, and he talks about how he's excited about the concept of going out into the universe, going out into the galaxy, meeting aliens, etc., and what a strong motivation that is. His drill sergeant instructor in this Space Academy just screams at him and says, "Dreamers will never make it. Dreamers may pay for it, but you need someone who doesn't dream to actually succeed in doing this, someone who understands the dirt and the danger and the fear." It was glamorized in Heinlein's story, but he's basically right. For the times that you're actually trying to do these programs and if you really want to be an astronaut, or you really want to be an engineer building this vehicle, you are having to deal with some really hard, non-romantic problems. It's only when you step back and have a drink and hear the music in the background, then it gets romantic. [Laughter]

That distinction, you have to find a balance between the two. I can't help but be romantic, but I keep telling myself, and my father said the same thing to me, if you get really turned on by your flying while you're flying, you'll kill yourself.
Because you're not going to concentrate on your flying. Because he's an Air Force pilot. It's true.

Unfortunately, during the EVAs on Hubble, I have to be very careful. It is such a beautiful experience that the desire is just to say, "Wow!" and totally kick back and release all of your concentration

you can and just enjoy the moment. As soon as you do that, you're going to screw something up.

Wright: Not a lot of room to fail up there.

Foale: No, unfortunately. I was very privileged, very, very lucky to be on the Mir during that EVA, because I had a pretty easy job once I was out there managing this crane for Anatoly. I could easy for twenty minutes at a time--no, I guess my kind of check cycle was like five minutes. Every five minutes, I think, "Am I screwing something up?" [Laughter] Then I'd go back to really enjoying the moment. I don't ever expect to be able to have that luxury again. I was very lucky to do that.

Wright: I'm sure your experiences will be many in the next few months, few years.

Foale: Yes, I hope so.

Wright: You'll start training when, for your next flight?

Foale: I've already started the Hubble, actually. I've already done a series of NBL runs here in the tank with the crew that were named. We went up to Goddard last two weeks ago. We were in bunny suits running all over the hardware for about three days. Then we have a whole bunch of NBL runs here coming up in September for a whole month, actually. Yes, I'm going to be quite tired.

Wright: It gets you out of the office.

Foale: It's good stuff, yes. Again, actually, I'll tell you one thing, I used to think [unclear] runs and the suit runs here were hard. I don't think they're hard anymore. [Laughter]

Wright: You do have experiences from that stuff.

Foale: Yes, because compared to the Orlon, which is the Russian suit, compared to the Russian hydrolab training in their tank, our training is really easy. [Laughter] This has something to do with the difference in pressures of the suits, and to do with the quality of the training hardware. After a two-and-a-half-hour run in Star City, I couldn't do anything afterwards. I was so tired, just totally exhausted.

After five- or six-hour run in the suit here--and I'd never done one before until just about two months ago; I used to be really apprehensive about it--it was not a big deal, not compared to their Orlon. So I've already seen the biggest highest hill, and I'm going downhill now. [Laughter]

Wright: That's good. That makes the trip a little easier.

Foale: Yes.

Wright: Well, thanks again. We don't want to hold you up. We know we have a busy schedule.

Foale: Thank you, guys.

Wright: We appreciate your time.

[End of interview]