ORAL HISTORY TRANSCRIPT

JOHN H. GLENN, JR.
INTERVIEWED BY SHEREE SCARBOROUGH
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SCARBOROUGH: This is Sheree Scarborough [assisted by Kevin M. Rusnak] for the Lyndon B. Johnson Space Center Oral History Project. It's August 25, 1997. I'm about to interview John Glenn in the offices of the Astronaut Selection Office [at the Johnson Space Center].

A good way to start today, I thought, Senator Glenn, was to talk about the Ohio and the Wright Brothers connection, since that hundredth birthday is coming up. Growing up, were they any influence on you at all?

GLENN: Oh, not the Wright Brothers specifically. I don't know why. I always had an interest in flying ever since I was a little kid, and I remember riding along with my dad in the car or something, and I'd have one of these little airplanes with a little prop that would run. I'd hold it out the window and watch the prop run and things like that. And then I remember when I was only about—I guess I was about six or seven years old is when [Charles] Lindbergh's flight occurred, and I still remember that as being an area of great interest around the community, more so than the Wright Brothers, as far as influencing me.

Then when I was a kid, I always built model airplanes, the old balsa-wood type where you had to really carve them out with a razor blade and glue them together, not like the plastic ones that snap together now, and I'd fly them, and they'd crash, and I'd repair them and fly them again, they'd crash, the rubber-band wind-up types. So I always had a lot of interest in aviation, but I never really thought in those days that I'd be able to fly myself, because

flying was pretty expensive.

What happened was, when I was in college, this was just prior to World War II, and the government had started a program called Civilian Pilot Training, CPT, and you could take flight training in little light planes. The one I learned to fly in was a Taylorcraft, 65-horsepower Taylorcraft with a Lycoming engine on it. I still remember that. And you could take this while I was in college. I took it while I was in college, and you could get your private pilot's license out of it and get college credit for it, and I thought that was too good a chance to miss, and so I took that. You got physics credit for it because you were studying engines and aerodynamics and heat transfer and metallurgy and all these things along with it. So, I took that, so I had my private pilot's license and about, I don't know, I guess around sixty hours of total flight time when World War II started.

So then it was a natural, then, that I would go into the service, and I volunteered then to go into flight training and went in. As soon as Pearl Harbor, I volunteered just a few days later and then was in flight training then for a year and went overseas in World War II.

SCARBOROUGH: Did you then do the test pilot flying, or was that after Korea?

GLENN: No, that was after Korea. I came back from World War II, and I liked flying. We were flying the old Corsairs, the old converted gull-wing airplane that is still pretty famous, even to this day. I had more flight time in that than anything I ever flew. I got over 3,000 hours in that old airplane.

I came back from World War II then, and decided I wanted to keep on flying. I liked it, loved it, and I was good at it. I won't be humble about that; I was good at it. So I decided

to stay in the Marine Corps, then, as a fighter pilot, and so then I was back doing instructing in the Training Command, and I got checked out in jets, then, when they came along and then was out again in the Korean War, in which we were, once again, doing close-air support, this time with jets.

Then I was with the Air Force. I volunteered to go up with the Air Force and fly F-86s against the MiGs, and was in part of that war just at the end of the war, right at the end. That was particularly interesting in Korea, because not only were we flying air-to-air combat there, my first air-to-air combat, but doing it with jets. But at the same time, you're using tactics that were basically World War I or World War II-type tactics, except you're going so fast that everything was expanded, but you're using the same basic weapons. We hadn't gotten to homing missiles and rockets and things like that yet for air-to-air.

SCARBOROUGH: Did it make it sort of clumsy or not work as well with the jet?

GLENN: No. Everything was happening. It was just like you went into a time warp, like you're speeded up, where in World War II—well, in World War II, I never had air-to-air combat. We were always on close-air support or on the ground attack except flying the Corsairs in the Marshall Islands. So when we went to Korea, we were doing the same thing, except flying close air in front of the troops and doing long-range interdiction flights back up country into North Korea. But that was all ground attack stuff with rockets and bombs and napalm, and doing work mainly in support of our troops on the ground.

But then flying for the Air Force, when I was accepted for that spot, and the reason for that, incidentally, was that they kept one spot for a Marine pilot in each Air Force squadron

because the Marine Corps didn't have airplanes for air-to-air combat. We had the guns on them, but they didn't have that kind of capability. They weren't that fast, didn't have the performance. So they wanted to get some Marine pilots with air-to-air experience, and so that's why they kept one spot. I volunteered for that, was accepted for it, and it turned out it was right at the end of the war. So that's where we were getting into the MiGs up along the alley right at the end of the war, and there was a lot of real wild flying. And that's where it was so much faster, because if you have an airplane coming toward you at 550 or 600 miles an hour and you're doing the same thing toward him, you're closing at 1,000 miles an hour, and your decision-making and your maneuvering have to be really accelerated on a speeded-up basis. But you're not using the kinds of weapon systems we have now. We didn't have radar to pick people up. It was all visual. And you had six .50-caliber machine guns mounted on your airplane, and you had to maneuver in behind the other airplane and get in to within about 800 to 1,000 feet with him maneuvering, too, and draw a lead on him.

It was that kind of flying, at jet speeds with World War I-type tactics, basically. So it was a unique time in fighter aircraft history, and I just felt lucky to be there at that time.

SCARBOROUGH: Interesting. Do you think that that experience helped you later on in your astronaut work?

GLENN: Oh, I don't know that it did. I suppose the fact that—one of the things they used in selection of astronauts, is they wanted people who had test piloting background and combat experience if possible, and not everyone in that first group of seven had combat experience. I think there were three of us had combat experience: "Deke" [Donald K.] Slayton had been in

combat in the old B-25s; Wally [Walter M.] Schirra [Jr.] had been on a carrier off the coast of Korea; and I was operating land-based in Korea. So I think the three of us were the only ones that had actual combat. But that was a factor in the early selection program, and I had a good combat record, and I'm sure that may have been one of the reasons that I was picked.

I shot down three MiGs in the last nine days of the war, and we were just getting into them. I was just into a shooting spot. And so I'm sure that, while there was no direct correlation between the speeds and things like that, the fact that you'd been in combat and been in dangerous situations was something that was of interest to people that were doing the selection in NASA.

SCARBOROUGH: Right. The ability to maintain control at those speeds.

GLENN: Yes.

SCARBOROUGH: I understand why they would be intrigued with you and want to choose you as an astronaut. What was it that made you want to go into the program?

GLENN: Well, before I left Korea, I had written a letter requesting assignment to fight test training, and that was accepted. So my orders out of Korea were to go home, have leave, and then go to Patuxent River, Maryland, Naval Air Station at Patuxent River, to the test center, and go through test pilot training and then be there on duty, which I was. So I was doing test work for about four years. I lucked into that, too, because it was a good time because it was the first of the Navy and Marine supersonic fighters and attack aircraft were just being tested,

and that's when I hit Patuxent. So it was a great time to be there. Then at the end of that four-year period, when I came off test duty and was assigned to the old Bureau of Aeronautics in Washington as a project officer, was just the time when—about six or seven months after that was when they started looking for astronauts, and I immediately volunteered. I thought that was a natural extension of the test pilot work I'd been doing, and sounded like it would be fascinating. So it was mainly because of that background, then, the immediate background, that I thought it was a natural step right on to the astronaut work.

SCARBOROUGH: Stepping stone. I see. Interesting. I want to touch briefly on the testing that went on, from your viewpoint. Correct me if I'm wrong. Really I don't think you've spoken about it at length, about the Lovelace Clinic experience or the Wright air experiences.

GLENN: At Wright-Pat [Wright-Patterson Air Force Base].

Scarborough: Right. I mean, I know it's been covered by Tom Wolfe, but I wondered if you could talk some about that period and some about the testing that went on.

GLENN: Tom Wolfe's coverage of it was pretty good. The movie was lousy, but Tom Wolfe's coverage in the book [*The Right Stuff*], I thought, wasn't bad at all.

SCARBOROUGH: It's pretty accurate.

GLENN: Yes. Well, they set out, and they made no bones about it, they set out to make every

measurement on the human body they knew how to make and do every kind of psycho testing that I think they knew how to do, and that's just what it was all about. We went out to Lovelace, and they made every measurement you can possibly make on the human body, all the usual things you'd think about, plus all the other things that would occur in any natural physical exam, and then things like, oh, cold water in your ear. You sit, and you have a syringe, and you put cold water in your ear for a period of time. This starts the fluids in your inner ear, in the semi-circular canal, starts them circulating because of the temperature differential, starts them circulating, and so you get the same effect as though you'd been spun up on a chair or something like that until you are extremely dizzy, and you had nystagmus, as it's called, your eyes want to drift off. You can't keep them focused on a spot. And then they would measure how long it took for us to recover from that. There was supposed to be some correlation to something, whatever it was. They had a lot of tests like that.

They had body density. You got in a tank, for instance, to measure your—they knew what your weight was, and to get your exact body volume, they got us in a tank, and then you rubbed all over your body to get even the tiniest of air bubbles off, and then you submerged in the tank, and they made a measurement then as to what your exact body volume was by the amount the water had raised. So they then could define from that what your lean mass and body proportions were, things like that you'd never think of.

They had us broken down into different categories of endomorphic, anthro—

SCARBOROUGH: Mesomorphs.

GLENN: Mesomorph, endomorph.

SCARBOROUGH: Ectomorph.

GLENN: Ectomorph. That's right. Those are the three. And at Wright-Pat, then, we went through analysis on that where they had us up there being photographed from every angle, top, bottom, side, with not a stitch on. Then they made all sorts of anthropomorphic measurements to define us into certain categories, things like that, that were never even thought of in a regular physical exam.

SCARBOROUGH: Did you all have to fit into one of those designations?

GLENN: No. No, they just wanted to see where we fit, was all. We'd already been selected at that point.

SCARBOROUGH: Oh, I see. Okay. What was your—

GLENN: No. Wait. At that point we had not been selected, I guess, either, but I think we were not selected on that basis at all, I'm sure.

Others were, went through a heat chamber test where they put you in, I think it was 135, and they had thermocouples on your body, and you had heat measurements being made on your body, including deep body temperatures. I think those were some of the tests where they used a rectal thermometer to see how much your actual body temperature had come up. And we stayed in there as long as you could, until your pulse was too high, they thought it

was getting dangerous. I don't remember how long we were in those. They ran tests like that.

They ran isolation tests, where they put you in an echoic chamber which is completely—no light, no sound, no nothing, and they had body sensors on us then to see how we reacted to that, and they wouldn't tell you in advance how long you were going to be in there. I remember my reaction to that very well, because they had these body sensors on, and I figured, well, they wanted to know whether under unusual conditions like this with no sound, no light, no nothing, whether you were still in control of yourself and what you were doing. They had us in there just at a plain desk before the lights went out, just sitting there, and there wasn't anything on the desk at all. I remember after the lights went out, I sat there for a while, and then I thought, "Well, I'll see what I can find in a drawer." So I found in a drawer what I thought was a tablet, and I tore off some pages to make sure I had a blank page, and I had a pencil, and so I sat there in the dark keeping track of what line I was on, and I wrote little doggerel poetry, which I like to do sometimes, and we still have that at home someplace.

SCARBOROUGH: How interesting. How wonderful.

GLENN: Yes, it was a good way to take up time, because you had to remember what verse—you had to remember where you were with this thing to make it rhyme or it didn't make any sense. And so I did that.

SCARBOROUGH: That's amazing. And you were in the dark. How did you—

GLENN: Oh, I'd just keep track. I'd write just by what I could feel like I was writing and keep track of where it was and then come down another line and do another—

SCARBOROUGH: Well, I had no idea you were a poet as well.

GLENN: I'm not a very accomplished poet. [Laughter]

SCARBOROUGH: Were there any tests at any point where you said, "I'm not going to do that"? Where you thought in your mind, "I just can't do that"?

GLENN: No, there was not. Some tests were tougher than others, but that's the way it was.

SCARBOROUGH: That's why you passed.

GLENN: And then they did a lot of psychological testing, too. They had a psychiatrist from the University of Pennsylvania, George Ruff. George went with us—well, George was there in the original testing program, and followed us through and did a lot of tests. We had every psychological test, every questionnaire, every interview, every Rorschach that you could fold out, and they always looked like butterflies to me no matter what they—

SCARBOROUGH: Apparently that was the right answer. [Laughter]

GLENN: Yes, it must have been the right answer.

SCARBOROUGH: You know, one of the things in *The Right Stuff*, from the movie version, that this kind of atmosphere was a competitive breeding ground between the first seven astronauts. I would assume that it might be something where you would begin to feel bonded with the other fellows who are going through this experience, almost like a hazing. Can you speak to that?

GLENN: Yes. I think there were two aspects to it. I think you did feel, once you'd been through this and you had other guys around who had been through it, you did have a little bit of a bond. But remember that in the early days of the program, we didn't know how far the program was going to go. For a while we didn't even know *if* it was going to go. It was all pretty much up in the air. So everybody was keyed in to making the first flight or an early flight to make sure you got to do something for all this effort. So it was very competitive, not during the selection phase itself. During the selection phase itself, I think there were 130-some people who started out originally to be screened, and then they immediately broke it down to, I think it was thirty-two or thirty-some that were put through the whole Lovelace Clinic thing. Then they made their selection from that.

One thing I might add here that I didn't think about, the fellow that was in charge of some of the NASA testing program was a man who had been a Navy officer in charge of selecting people for special duty, like for hazardous duty work, for special submarine operations and special underwater operations and special naval volunteer SEAL operations. He'd been in charge of selecting people. His name was Bob [Robert B.] Voas. Bob was the one who sort of set up some of the selection criteria or worked with the other NASA officials

in setting that up. But they didn't know, no one knew for sure, exactly what it was we were going to be doing. We knew we were going to be going into orbital flight, but what was going to be required or what pressures would your body operate at, and what Gs could you take and things like that.

So, once we were selected and started into this whole training program, it was sort of open-ended as to what kind of things people could think up for us to do that might have some weird, remote application to space flight, and we had some pretty good ones that people thought up. We didn't know what we'd be able to do as far as high Gs. We were going to be taking the G levels in a different direction than you normally do in a fighter aircraft. The Gs would be taken on a vector straight into your chest, because we were going to be lying down in a supine position. So you're in bed, and the whole bed was being accelerated straight upward. In other words, you're taking your Gs into your chest. We called the two different positions EI or EO—"eyeballs in" or "eyeballs out"—was the way the G forces were going.

They didn't know what we'd be able to do at high Gs, and so they took us up to the Naval Air Development Center at Johnsville, Pennsylvania, where we had a fifty-foot centrifuge arm, human centrifuge arm, and they had not an actual replica of the spacecraft, but a seat like you would use and a couch like you would use in a spacecraft, mounted on a capsule on the end of this fifty-foot arm, and as the arm started to rotate, went faster and faster and faster, the capsule, then, would turn so that your G vectors that you were taking in that capsule out there were the same as you'd take in a spacecraft on launch. In other words, they turned it so when it was going at that really high speed, your Gs were straight out from that arm, if you follow this.

SCARBOROUGH: I think so.

GLENN: Then, as you slowed down, they could gradually bring the thing down so that when it stopped, why, then you were back to vertical again. We worked up—we had all gone up to, I think, ten Gs or something like that, ten or eleven, and then Al [Alan B.] Shepard [Jr.] and, I think, Al and "Gordo" [L. Gordon Cooper, Jr.] and I—I'm not sure whether the others did or not. I don't think everybody went through it, but we went up to sixteen G. We were trying to see what we could do, and sixteen G, even in that supine position with the Gs straight into your chest, you're straining just as hard as you possibly can strain to keep enough blood up in your head to keep from blacking out. Now, if you even just thought of relaxing a big, your vision would start coming in tunnel vision and you'd start getting big black splotches going around. At sixteen G, you're on the verge of losing control no matter how much you strain against it.

SCARBOROUGH: See, I can't imagine that. I mean, I would have been gone at one G, but what was it that you held onto in your mind that kept you at that level of consciousness?

GLENN: Well, you just were fighting what was going on and just concentrating.

SCARBOROUGH: Amazing.

GLENN: I remember at seven Gs was about as high as you could go and still get your—your arms were supported out here like this on the side, in a trough like they would be in the

spacecraft, and I remember we were trying to define, too, one of the things we wanted to define was at what G level you could still reach up to change a switch or something on the instrument panel, and seven Gs was about the most—you couldn't lift your arm out of the couch, no matter how hard you tried, you couldn't lift your arm out of the couch above about six to seven Gs. Beyond that you were just supported there. You could still see, and you could watch the instruments. That was a level that was important, because on the Mercury flights we were expected to get up to around eight Gs, and that was what happened later on. I got up to 7.9 on the first orbital flight, 7.9 on exit, on insertion into orbit, and 7.9 during reentry, coming back in.

SCARBOROUGH: So that training helped you decipher what the astronaut could possibly do during that period.

GLENN: And know what you could do and couldn't do. On the centrifuge there was another exercise that Al and I went through on that. I think just the two of us are the ones that did this one. We were concerned that if you came back in, you had to make an emergency reentry and you came back in and you did not hit on water. If you landed on land, that was going to be a major impact. And if you landed where there was wind and the wind was over—I think we figured fifteen knots or something like that, and you hit, that meant the parachute would detach immediately, but then you're hitting sideways, and the capsule would probably tumble. So if you took Gs out of the couch, what would your reaction be to that and what could you take?

Those were real tough runs we did on the centrifuge. What we did was set up our

restraint system to see whether it was adequate. The restraint system was plain, had the belts, the crotch strap hooked into the belt, the shoulder straps came down and hooked into it, too. And what we wanted to do was simulate Gs where you were coming out of the couch and hitting the restraint harness. So what we did was go to Johnsville, and we turned this thing up to—I think we started at only two Gs, and we worked up one G at a time, and we would get at that G level—let's say it's three Gs. You're going around at three Gs with the capsule out here, and then they could rotate that capsule on the end of that arm so that you went from positive Gs to negative Gs in about—I think they rotated the whole thing in something like two seconds or two and a quarter seconds like that. So, rotated the thing around pretty fast. So in two and a quarter seconds, you went from EI to EO, eyeballs in to eyeballs out, which meant you hit the straps. It also meant that if you were going around at three Gs and in two and a half seconds later you're at three negative Gs, you just had a delta of six Gs there, which does wondrous things to your internal organs, obviously.

So we worked that until—one of the flight surgeons, Bill [William S.] Augerson, he was doing these runs in advance of us. We didn't usually do that, but on these runs he wanted to do them, and so he was doing them in advance of us to see what effect it had on him. We got up to—I think Alan and I had done a four to four, which was a delta of eight Gs, and that was a pretty rough one, and I think Bill Augerson was doing a five to five, and he came out of it at the end of the thing, he was breathless and was coughing and couldn't seem to catch his breath. So we decided we'd stop for a little while before Al and I did them and see if we couldn't figure it out.

We all went down to where there was an anthropomorphic dummy that you could take the parts off of, you know, and look at the internal organs. It was one that had all the internal

organs in place, like they have at a med [medical] school. We peeled this thing off and kept turning it so we got the same vectors so we could figure out the vectors as you rotated this body, and what we basically found, or the doctors determined was that—let me back up a minute. You know, the heart is sort of a free-swinging—in your chest, your heart isn't exactly lashed down with nylon ropes in there. It's sort of connected, of course, to everything, but it's sort of free-swinging in a way. And what they found was that you track the vectors through, the heart was sort of swinging around and coming up behind one lung and knocked the wind out of one lung. And so we decided at that point—the doctors and Al and I decided together that that was about enough of that experiment. Bill Augerson went through that one, and I think Al and I had been four to four. I think Bill was on a five to five, if I remember correctly.

SCARBOROUGH: But he recovered fully?

GLENN: Oh, yes. He was all right. What he had was what they called, as I remember now, alveolar compaction. Your lungs are made up of all these little alveoli, and they're little air sacs, in effect. On the high G runs that we made up there, we would come out sort of coughing, and what they figured was that the Gs were so high, they were sort of compacting your lungs and forcing air out of part of it so you felt uncomfortable when you came out. You wanted to [Glenn coughs] cough and open this up. And that's what Bill had run into. It just literally knocked the air out of his lungs.

SCARBOROUGH: That's an amazing story.

GLENN: The other thing that I might add, too, on hitting the straps, we hit the straps hard enough on the four-to-four runs that we had what they call alveoli—was that it? I guess that's it. Which are your little tiny blood vessels just under the skin were ruptured. There's a name for it, and I can't think of what it is. Anyway, we hit the straps hard enough that it made a track where you had these little—you could see right where your straps had been when you took your shirt off because of the track here where all these little things were—where you'd hit the straps pretty hard, you knew that. Anyway, we went through a lot of training like that that was very unusual.

One other one that—you're not getting to ask many questions.

SCARBOROUGH: Can we pause that for one moment? [Tape recorder turned off.]

GLENN: One other one that I think is interesting, too, is they didn't know in the early days, if you had a runaway spacecraft—by runaway I mean not runaway in speed where it's going off to the moon or something, but rotational speed. Let's say you have a thruster, and it starts turning in roll and you can't control it, and it's going faster and faster and faster and faster. Where does the astronaut phase out as being able to control this thing? And they wanted to find that. So up at Lewis Lab at Cleveland, they built a rig, and it was called a MASTIF, Multi Axis Space Training Inertial Facility, MASTIF. It was a big thing, about fifteen or eighteen feet across, and it was three gimbals, one built inside the other, one for roll, one pitch, and one yaw. In the middle, then, they had a simulated cockpit where the astronauts sat in the couch, with the rate instruments that you would have for controlling the spacecraft on a

panel in front of you. You had a control handle there, a three-axis control handle like we expected to use in the spacecraft, and by compressed air, they could turn up any one of these gimbals in whatever mode, either in roll or pitch or yaw, or two axes as a time or three axes all at once. They would turn it up, and then it was a heavy rig, so then they're turn it loose, and it's coasting. And then in the simulated cockpit in the middle, at that point, then, the astronaut took over and would try and bring this thing back to zero in whatever axis was operating, and you had your rate instruments here in front of you to give you the cues as to what you should be doing.

Well, they started out just in one axis at a time, say yaw. You would rotate and you'd learn how to control that to zero. Then you'd do pitch and then do roll, and you'd do them one axis at a time. They they'd combine two axes and then three axes at a time. Sort of the graduation exercise beyond which they didn't go, we rode that thing and were at 30 RPM in roll, pitch, and yaw simultaneously, all at the same time. Now you figure your body motion's going around like this in roll, pitch, and yaw at the same time like this, and you're in there looking at the rate instruments trying to control this thing down, and it was the original vomit machine, I'll tell you. That was a gut-buster.

So that was another one they dreamed up for training also, but the only time that was ever used was, I think Neil [A.] Armstrong on the Agena, he had plugged into the Agena, and it stuck, and they were rolling faster and faster—I think it was roll. They detached from the Agena, which was causing the problem, and so they controlled it. That was another training vehicle, though, that was a weird one, very weird.

SCARBOROUGH: It sounds like torture to me.

GLENN: Well, it was. That was a real ride.

SCARBOROUGH: That brings to mind what you said about how much control the human element has, and that's one of the things that comes across a lot in things that you've written or speeches that you've given as being an important part of the space program, and that always interests me. What do you think was learned from your particular flight in terms of the human touch?

GLENN: Well, I think my flight was sort of—the main purpose of it, while we were supposed—I say "we," but while I was supposed to do some research in spectrographic work and some things like that, which I did, straight science work on that, but the main purpose of my flight was to find out what reaction the human body had to extended weightlessness. Some of the doctors, for instance, before the flight thought that my vision might change during flight, because when the eye no longer had to be supported by the structure under the eye, it might gradually change shape, and if it did, you might get horribly myopic or something where you couldn't see properly. So, on the instrument panel—and you can still see this up in the Smithsonian [Institution] on my spacecraft, Friendship VII, up at the top of the instrument panel is a little Snellen chart like the eye chart they use in doctors' offices, miniaturized for the distance from my eyes to the panel, and I was to read the smallest line I could read every twenty minutes all during flight and report what that was, so if my eyes were changing shape or vision was changing, I would be able to report this.

Another one, some of the doctors at that time felt that when you're weightless and the

fluids in the inner ear that give you your main sense of balance, when you're in weightlessness and those fluids are more free to just randomly move about, rather than being held down by gravity or sensing acceleration as you change your head position, you might get uncontrollable nausea and vertigo and not be able to make even an emergency reentry because you'd have such nystagmus that you wouldn't be able to see the instrument panel properly. They were very concerned about this, enough so that they had not only pills that I was to take if I started feeling the least bit woozy, Tigan [phonetic] pills, which was the latest motion-sickness material at that time, but they also had that stuff in a solution, and it was in a pocket on my leg, in a special syringe that it was in, so that if I needed this stuff, I could take it out, take the safety catch off, hit my leg, and a spring would be released that drove the needle through the suit into my leg and injected the serum, all at one time. And that was to be a get-me-down type operation, if I was getting so out of control that I felt I had to make an emergency reentry wherever I was.

So, eyes were one thing that I was to check. Whether I felt any imbalance or vertigo was another thing to be checked. They didn't know whether you could swallow properly or not. I wasn't going to be up long enough that I really had to have a meal or two meals or anything, but they wanted me to take material along to swallow, which I did. They wanted to know if there was any change of feel, fingers or anything like that, any tendency toward any sickness, whether it was induced from the inner ear or wherever. It was more to find out the body's reaction to flight so we'd know whether we had to make any adaptation before we could go on to longer flights or to the flights that would later build up to go to the moon.

SCARBOROUGH: More the physical responses of the body.

GLENN: And I think many of the things they were concerned about we did put to rest on that first flight or certainly in the first two or three flights.

SCARBOROUGH: And that did become a building block for the whole human space program?

GLENN: Oh, yes. Well, I think every flight is a building block for the next one. I thought that right from the start. You know, Al Shepard's suborbital flight. Well, okay, that's the first time we got above the atmosphere. Then I built on Al and Gus' [Virgil I. Grissom] flights in Redstone. And then other people came along and extended what I had done beyond the five-hour point. We ended Mercury with "Gordo" up on a twenty-five hour flight, of course. So through Mercury we pretty much proved what people could and could not do in space and whether we could work in space or not.

SCARBOROUGH: Right. Speaking about those first three flights, I wanted to ask about the decision and the choice of which astronaut went up in which flight, and a lot has been written about that, and I just need to ask you because I'd be remiss as an historian if I didn't ask you, especially from your vantage point now in '97 and especially after the whole space program. What happened to you after your flight, in other words becoming America's first hero, or one of America's major heroes?

GLENN: Well, after my flight I wanted to get back in rotation and go up again. Bob [Robert R.] Gilruth, who was running the program at that time, said that he wanted me to go into

some areas of management of training and so on, and I said I didn't want to do that. I wanted to get back in line again for another flight. But he said headquarters wanted it that way, at least for a little while. And I didn't know what the reason for this was, and I kept going back. Every month or two I'd go back and talk to him again about when do I get back in rotation again, and he'd tell me, "Well, not now. Headquarters doesn't want you to do this yet."

SCARBOROUGH: When he said "headquarters," what does that mean?

GLENN: Washington [D.C.] NASA headquarters in Washington.

SCARBOROUGH: So what people are those? Who was the head then?

GLENN: Well, that would be Jim [James E.] Webb at that time.

SCARBOROUGH: Thank you.

GLENN: If I'd know as much about Washington operations as I know now, I'd have gone to Washington and talked to somebody, but I didn't know that much then. So I accepted that for what it was, and this went on for the better part of two years. So I finally decided that I'd go on and do other things, because I didn't want to stick around forever. So I did, and wound up eventually in the [U.S.] Senate. I didn't know until some years later that apparently President [John F.] Kennedy had said that he would just as soon I wasn't used again for a while, and I wasn't aware of that at the time. I guess after my flight there had been such an outpouring of

national attention, that if you weren't there and went through it, it's sort of hard to comprehend the attention we had and the—I guess "adulation" is the only word that comes to mind. But that's what it was. That's not very humble of me to say that, but that's exactly what it was.

SCARBOROUGH: Well, it's just a fact. It was directed at you.

GLENN: And I guess that President Kennedy—I don't know whether he was afraid of the political fallout or what would happen if I got bagged on another flight. I don't know what it was, but apparently he didn't want me used again right away. And then, of course, he was killed in November of '63.

SCARBOROUGH: Did he ever mention anything to you? I know you had several—

GLENN: No, he never did, and I wish I had known at the time. I'd have talked to him about it. [Laughter]

SCARBOROUGH: You would have gone straight to the source in Washington. [Laughter]

GLENN: I would. So that's the reason I never got another flight. Bob Gilruth kept saying, well, that he wanted me here as a training and management, plus the upcoming flights should go to people who would be useful for the early lunar landings, and that by the time those were expected to occur, I'd be over fifty, and that might be a little too old, and besides,

headquarters didn't want me to go yet on another flight. So all this together, I never got a second flight. And it wasn't that I had not done a good job on the first flight.

SCARBOROUGH: Obviously.

GLENN: Yes. I had problems on that first flight, control system problems, and some indications of—we made an unusual reentry, and we had to leave the retro pack on, let it burn off. So we came through all that in good shape, so I got nothing but high marks for performance on the flight, so I knew it wasn't that. So that's the only reason, I guess, I never got a second flight. So I'd still like to make one to this day.

SCARBOROUGH: Well, that is a good lead-in to that question, since we are out of time, but I wanted to ask you real quickly, do you look back and regret that you didn't have a second flight then?

GLENN: Oh, yes. Sure. Absolutely. Yes, I wanted to go up again, and I'm sorry I didn't. I'm sorry I never was in line to make one of the lunar landings. I'd like to have done that.

SCARBOROUGH: Well, why do you want to go up now?

GLENN: There are some things that have happened that I think are extremely interesting strictly from a research standpoint, whether it would be me go up or whether it be somebody else. Things happen to astronauts in the normal thirty to-fifty-some age bracket when they go

up now. Their cardiovascular system changes. Their orthostatic tolerance, the ability of the body to keep blood in the upper part of the body changes. Osteoporosis sets in. The body's immune system changes. They have less immunity. Now, when they come back to Earth, they go back to normal, and it may occur over a few days or a week out to a month or so, something like that, maybe a little longer for the extreme flights like Shannon Lucid was on or something like that.

Now, what's the correlation? Those same functions can be defined as things that happen to the older folks in our society just by the fact of growing older. Osteoporosis sets in, more in women than in men, but in men, too. The cardiovascular system changes and the body's immune system changes. Now, NIA, the National Institute of Aging, is interested in finding out that if you would send an older person up, would that person be more or less immune from the changes that the younger people go through, or would that be additive to what's already occurred? Would my immune system be affected more or less? And what they want to look at is what triggers off these things. What triggers off the body's osteoporosis? What triggers off cardiovascular change? What triggers off the body's immune system changes? If you can find that out, for instance, maybe you'd have a whole new approach to cancer and disease and AIDS and problems with the elderly, as well as maybe problems with why the immune system changes for younger people in microgravity.

So, it's a whole new area, and it's of interest. There are about 44 million Americans over the age of sixty right now. They're very interested in this, I can tell you, just by some of the rumors that have been in the paper about me. I've received a ton of mail from people.

SCARBOROUGH: I'm sure.

GLENN: So this is not something just to give John Glenn another flight. This is something to really start a new area of research that I think can be very, very important, and that's the reason it's so fascinating to me. Much as I'd like to go up again and just joyride around, we don't have the luxury in our spacecraft yet of just letting people go up just to get the view. This is an area of very, very proper research that has the potential to it of enormous benefit for—well, the graying of nations, they call it, all over the world. Our average age is getting older and older, and if we can learn some of these things by starting a program like this now, it could be tremendously beneficial, I think. That's what makes it more exciting even than just looking forward to going up again from a personal basis.

So, that's what's behind it, and NASA's looking into it now and seeing whether it can be worked out or not. Whether I would be the one that goes up or not, I think they should start this program, whether I'm the one involved with it or not, because it's that important. I think it's also a natural to have someone like me go up as a first shot at this. They'd like to have somebody between seventy-five and eighty years of age. Well, I fit in that ball park. The oldest person we've had up before this is [F.] Story Musgrave at sixty-one. So this would be a little jump above that. But I think it's natural to have someone that's been up. They're getting a semi-known quantity. They have the baseline information from me for years ago.

SCARBOROUGH: Right. That's important, I think.

GLENN: They know I'm not going to panic up there for some reason or other. So, starting out with astronauts, I think, is a good way to do this. It would be more than just one person

going up. Obviously, one person does not a database make. You would want to plan something with eight or ten or twelve people over a period of time, and then you start laying a database for what you may find out that may be beneficial to elderly people right here on Earth.

[End of Interview]