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APOLLO 12

MEDICAL DEBRIEFING TRANSCRIPTION

SECURITY CLASSIFICATION

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Portions of this document will be classified [redacted] Group 4, to the extent that they: (1) define quantitative performance characteristics of the Apollo Spacecraft, (2) detail critical performance characteristics of Apollo crew systems and equipment, (3) provide technical details of significant launch vehicle malfunctions in actual flight or reveal actual launch trajectory data, (4) reveal medical data on flight crew members which can be considered privileged data, or (5) reveal other data which can be individually determined to require classification under the authority of the Apollo Program Security Classification Guide, SCG-11, Rev. 1, 1/1/66.

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GROUP 4
Downgraded at 3-year intervals; declassified after 12 years

[redacted]

Downgraded to "U" by E.O. 11652, June 1, 1972 - 11-3-76 - Sally D. Gates

Manned Spacecraft Center

December 1969

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INDEXING DATA

DATE 12-00-69 | OPR MSC | # | T R | PCM SPM | SUBJECT | SIGNATOR msc | LOC

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INTRODUCTION

This is the transcription of the Medical Debriefing from the Apollo 12 mission. Communicators in the text may be identified according to the following list.

CONRAD	Charles Conrad, Jr.	Commander
GORDON	Richard F. Gordon, Jr.	Command module pilot
BEAN	Alan L. Bean	Lunar module pilot
BERRY	Charles A. Berry, M.D.	
HAWKINS	Willard R. Hawkins, M.D.	
ZIEGLSCHMID	John F. Zieglschmid, M.D.	
BAIRD	M. Keith Baird, M.D.	
KEMMERER	Walter W. Kemmerer, M.D.	
JERNAGAN	Clarence A. Jernagan, M.D.	
FISCHER	Craig L. Fischer, M.D.	
SPEAKER	Unknown Speaker	

A series of three dots (...) is used to designate those portions of the communications that could not be transcribed because of garbling. One dash (-) is used to indicate a speaker's pause or a self-interruption and subsequent completion of a thought. Two dashes (- -) are used to indicate an interruption by another speaker or a point at which a recording was terminated abruptly.

UNCLASSIFIED

SPEAKER ... is the Apollo 12 Medical debriefing held December 4, 1969 in the LRL press room. The participants in the briefing are Dr. Charles A. Berry, Willard R. Hawkins, M. K. Baird, John F. Zieglschmid. On the - within the barrier are Dr. Clarence Jernagan and the Apollo 12 crewmen.

SPEAKER ... the third day.

BEAN I had one the day - the next day after we got back from the lunar surface, and then I had one the following day after that on what ever day number that is. I think Dick had one the second day after we got back. Maybe he had it the first day after we got back. He had one the same day I had one of mine.

HAWKINS That'd be five and seven for Al.

BEAN ... three.

GORDON I can't remember until after they got back, but I know it was the third day we had ... I guess it was the day after you got back.

SPEAKER Yes. It wasn't that night; we didn't know it that night. It was the following day.

BEAN That's right. It was the following day.

BEAN I saw that bag; I put my ... in GET ...

SPEAKER ... most of the dates on there ...

SPEAKER Oh, great.

BEAN I put my name and the GET on the bag, though.

SPEAKER The first crew that's done it. You're the first guys who did that. Great. Congratulations. That's wonderful. (Laughter)

BEAN ... I put the GET on every bag so - and the names so I guess - -

SPEAKER Give them an award for that.

SPEAKER Right. Give them an award. (Laughter)

CONRAD ...

SPEAKER Right, Pete. (Laughter)

SPEAKER We were just checking that, Pete. You had one and it was on the third day out, right? No more in flight? Okay, we've got the postflight histories so we don't need to do that.

CONRAD I set the record; it was about 11 or 12 days there and - -

SPEAKER That's a long time.

CONRAD It bothered me. ... 11.

SPEAKER Good. Very good.

SPEAKER ... be the last day, I guess. ...

BERRY Listen, we thought - we've all gone through all this material - that - things that you said so far and then as a result of that we have some things that we'd like to back and pick up with questions so it may sound like they're, you know - they're not in any particular order and if - if you want to amplify something that we ask, well, feel free to go ahead and do it. But we'll - we'll try and pick these things up as we go along. I guess the first one which might take more time relates to the EVA time period and we wanted to get a feel from you, Al, if you could relate in some sort of percentage figure what you thought the effort required during either of those EVA's, your MAX effort that you put out in relationship to what you did on the bike that last time you did it on Sunday, down there. At 180.

BEAN I'd say the general effort - the general walking-around effort was probably one of the low, I don't know how you'd start off with the bike, I don't know what the number is, and I'm having difficulty right now remembering how much it is, but it was down near the very lowest end of what you do on the bike.

BERRY 120. Approximately 120.

BEAN 120; that's the general level of effort right down on the low end and then you start at 120 and you probably go - Would you go up another 20 or something - 140? I say that the normal work is right in there. You can't seem to work too hard up there. You're working as much as you can, but you don't seem to be working too hard because of those pressure suits and because of the way the operation is

BEAN (CONT'D) there. And the MAX effort, as I recall was either carrying out the ALSEP, or the one I remember the most was coming out of the crater. And it seemed to me the work level there was about equal to a little more than half as hard as you go fast on the bike. I never worked as hard as I did on the bike or even came close to it. You just don't work that hard up there, for some reason.

CONRAD I think one of the interesting things was - There's only two times I remember being tired and one of them was more being thirsty than tired and that was when we made a long run from sharp crater over to this halo crater and the other time, I agree with Al, the only time I really noticed that I wanted to stop doing was - really wanted to stop doing something was - was coming up out of the crater, after getting the Surveyor parts. But we were loaded then. We had the MAX we were carrying as far as the second EVA went. Al had a whole load of rock in that tool carrier and I had Surveyor gear on my back and it became apparent to me that if I kept charging up out of that crater, I was going to get tired. But the other thing about it that to me was pretty interesting was that any time I thought I was getting tired, if I stopped for - never needed the 3 minutes - if I'd stop for 1 minute and give myself a shot of that intermediate cooling - I never could stay on intermediate cooling, as soon as it started to flow, I'd go right back to MIN cooling because it would get too cold. But that would sort of take the heat loads out of the suit, and you'd stop for about a minute and press on. I never really - I never felt I was going down hill. That's the interesting thing. I never felt - I don't think Al felt that way either. When we finally got up out of the crater and got back to the LM and we had hustled all the way, we were both very disappointed that we didn't stay out, and I guess if we'd asked to stay - my understanding was that we were going to be extended once and we shouldn't ask, and that was a real tactical error as far as I'm concerned in not getting more rocks. We should have stayed out. We got in that damn LM and ... ourselves for 2 hours and not a damn thing to do and we were really not that tired.

BERRY Did you have any time that you were aware of your heart rate, other than - You commented once, Pete, during that run from sharp to halo that you were aware that you had a fast heart rate.

CONRAD I was surprised to find out that my heart rate never exceeded 100. I never had the impression that it ever got over 100 and I was more impressed with the fact that I felt that it had done real well the whole time and I guess maybe 100, I don't know what I got to, ever was - If I get over 130 I know it and I know that I never got close to anything like that. But apparently it was higher than I thought it was.

BERRY You - -

CONRAD I get ... at that level fairly constantly the whole EVA. But that's a very comfortable level. I could have gone that way all day, whatever it was. I still don't know what it was. I've heard two numbers. Somebody said 120 - -

BERRY Pete, you - They varied between the first and the second EVA. Both of you ran lower rates on that first EVA than you did on the second one. On - -

CONRAD Hustling the whole damn time on that second EVA - -

BERRY Right.

CONRAD - - we never stopped; we stood around the ALSEP, that - That's the kind of work that might tire an arm, but it's not going to make your heart rate go up. Your arms are going to get tired twisting Boyd bolts or holding something, but you're not moving - you're always moving. You're either falling over getting something or trying to stick it in the bag and then ... all the gear and running, so I can understand why it ran higher on the second, but it wasn't bad.

BERRY Yes. Well, you - You ran consistently. Both of you were constantly above 100 on the second one and most of the time above 120 the bulk of the time. And you, Pete, did 170 during that run. You both got up to 170 during that time you were running.

BEAN I wouldn't have guessed that either. I would have figured I was down around 125 or so. I know that ... had his POGO meter in the centrifuge if I would run at the 4 miles, 4 feet per second, it seemed a natural run for me in either of the POGO's. My heart rate would get about 130 and I felt that I could run that way for hours - just - I never got tired and hit that level and I breathed sort of hard, but I could keep going. And I kind of felt that when we were moving around out there most of the time particularly that second EVA. And that's where my heart was, except - what'd

BEAN (CONT'D) you say - going from sharp crater to Surveyor crater and coming out of that crater I felt that I was well up around 160 or so, but I - it was funny, that level - that level that we working at, right around that, appeared to me about the normal level that I was running in the centrifuge at I'd say that's a fourth foot per second level was - seemed to me to be a normal operating speed. So I'll bet that those heart rates compare and I - I wouldn't be a bit surprised. I felt that I was more tired from the second EVA than the first, particularly in the hands. Even when I got out on the second EVA my hands were a little tired and when I got out on the first EVA and got back in - maybe it was the excitement - I didn't feel tired a bit. I felt like I could have stayed out another 4 hours on that first EVA and never even bothered me. So I don't know what the ... of might be but I was a little bit tired starting out the second and it kind of went away and stayed that way all the rest of the time until we got back in. I could easily have stayed out another several hours.

BERRY Well, did you ever sweat, either one of you?

BEAN I tell you, I couldn't - I went to intermediate cooling about three times the whole mission and I couldn't leave it there. You just can't work as hard. When I'd run in the centrifuge over here on this ... I could run hard enough to put it up to MAX cooling and leave it there and sweat like the devil and do - And I would be working as hard, you know, I'd be working pretty hard but I could ... when I got out on the lunar surface, I didn't. I couldn't work any harder than ... what we had to do and moving around and not falling down, I couldn't put out any more work than that. I guess if I'd stood there and held the ALSEP up, I probably could, but just the normal tasks never made your work that hard.

CONRAD I used intermediate cooling more than that, but - but only for long enough to get the thing to start to flow and then I'd have to turn it right back off again and it would usually be the end of either after we'd run somewhere or to something and I never - oh, sure, I perspired some, but I never - not enough to ever notice that anything like my feet were wet or anything like that.

BERRY Yes.

CONRAD Now, my hands were - after both EVA's, those gloves - the interliners were always soaked. But you just don't get good cooling down there anyhow.

SPEAKER ... sweat.

CONRAD But at the end, mine always were that way during practice.

BERRY What about the - the falling down now. You said that - you said you - you actually fell down one time and then some other times you went down to get the rocks you implied that you - that you literally sort of let yoursef go co -

CONRAD What we'd do was stick the shovel in the ground and you just pull straight out on it and use it and grab a rock and what happened there one time was I just rolled off to the left and - Al was standing right next to me - -

BEAN You put the shovel down and you'd go to about here and then he'd kind of lean down kind of like this - you're kind off balance and that time he just kind of tipped over.

SPEAKER Ro - -

CONRAD That just pushed me - just rolled me back and I pushed up with the shovel handle - -

BEAN I grabbed his shoulder and he just pushed up.

CONRAD He was standing right there. But I - if you fall over, I don't care where you fall over from, it's no big deal. I think the big point was the first 10 minutes - and you can really see it in the movies - I really hadn't decided if I'd fall straight on my face for 10 minutes and the big reason was - is that one of us was used to leaning over as far as I should and Al made a comment out of the window about how far forward I was leaning over. And, too, I tried to walk and that's stupid. I don't care if you just want to go one step, you ought to hop and then after about 5 or 10 minutes I never had this impression that Neil or Buzz had. I always knew where the local vertical was and it didn't make any difference whether I was running on slopes or what I was doing I never had any trouble figuring which way was up or what kind of slope I was standing on. And I never had this falling over feeling after that. And we just swooped down through craters, around them, over, anyway you wanted to go, change directions and you just - you adapted and learned to lean. If you want to change ... you

CONRAD (CONT'D) got to lean a little bit. The only other time I almost got in trouble was at the end of the second EVA - I jumped up and did a 180. Boy, you ... get that mass on your back and I almost fell over doing that. I just wanted to experiment and see what would happen. But I think you adapt real well up there and I don't think there'd be problems if you did fall over, from any direction, fall over on your back - or - that - That's another thing, I never had the feeling I was going to fall over on my back at any time. It was always, I felt if I was going to fall, it would be left, right, or forward. But I got rid of that very fast.

BERRY Same for you, Al?

BEAN About the same. I think I'd be ... and be getting hopping around there and after about 5 minutes you - you don't watch where your center of gravity is so long as you just keep moving and you move around enough so that you never fall over. A couple of times I backed into the - the tool directly behind me, after taking some pictures of rocks. One time on the Surveyor slope, I ran into the - the gnomon had been stuck on the tools and I didn't know the gnomon was there and I think I ... earth and it's true that I'd probably have fallen down. Because I backed, you know, I was off balance, but you fall down so slowly there that you - you have a chance to move, to turn around, move around and catch your feet. A couple of times it never - -

CONRAD - - couple of times we didn't.

BEAN - - Get moving and we'd - you'd almost fall over - you'd kind of run up under yourself. Couple of times - -

CONRAD Yes. I remember that.

BEAN You remarked about it once. I nearly fell over on my face. I don't know what we were doing, moving something, and I could see I was starting to fall and it was so slow that I could start running and I ran up under myself and didn't fall down. I don't think - I agree with Pete about falling down - I don't think even if you do it's going to bother you. You'll always be able to go to your best possible position or your ... or anything else.

CONRAD In retrospect, too, I think we could have used our 30-foot tether and gone down into that steep crater - have one guy hold it and the other guy back down in it. I think ... get

CONRAD (CONT'D) up to maybe 20, 25-degree slopes, and depending ... was all this business about the soil giving away underneath you was never that way. As a matter of fact, the Surveyor crater was probably the hardest soil we were on. I thought we were on about three different types of soil when we were there. One near crater 1 by the LM, and than at sharp crater where we got into the softest, finest, but it was no big deal. You could always - It never had a tendency to slip out from underneath you. We never had a slippery feeling that Buzz and Neil talked about, that their feet tended to slip. I never noticed my feet slip once. I was aware of stepping on rock a time or two and that may have been what they considered as being slippery. But it was very apparent. That's the only sense of feel I ever had in my feet. The only reason you'd know you were sinking in further or less when we were running over the terrain was if I was in front of Al, he'd comment, you know, "Boy, you're really sinking in up there," but I wouldn't be aware of it. And I could see that when he'd be out in front of me or something and we'd run through the side of a crater, these little impact craters ... but there's one - I ran off a movie today and I run right through the side of a little crater out there and you can see my foot goes in maybe that far in one place, but you don't notice it and you don't feel it.

BERRY Did you have any trouble telling the size of the - the steps and things that you were taking? Did you feel that it was the same as what you would do down here, like if you took a big one, did you know you were taking a big one?

BEAN You're the one who had to tell me how big a step you were taking. You know, when you were running back in from the ALSEP you said I feel like I'm taking some number of foot steps.

BERRY You said two, and you said four.

BEAN Yes. And you said ... ten, and I looked and it looked like you were doing about four to me.

CONRAD But there's very cumbersome ways you get into - There's two ways you can run. And they're both the same way but if you really push you can go big way but then that all seems slower than running at this slower pace because if you push real hard you sort of float whatever the greater distance is and that's not quite as comfortable, you don't feel you really have the control and you also have the feeling that

CONRAD (CONT'D) you get tired. That's sort of a MAX effort but MAX effort can come very slow because it's a long sort of ... and I've found that I had two ways of running and Al ran it different. He always ran the same way. Sort of equally with both feet. I had the tendency to skip like I was a kid, with one foot. But when we were going long distances, then I'd remember he said, run equally, then I'd start thinking about running equally, and that's why, I would say it was 10 feet was really 4 feet and that was really comfortable. I felt ... all day.

BEAN I really think that both the POGO and that centrifuge POGO are just like it. I'd like to get out - when we get out of here I going to make a run in one and try to remember now what we did out on the moon was try to get some comparisons because I think I can remember how it was on those 8 hours or so we spent. I'd like to see what it take to do that kind of work. I know what's going to happen; it's going to be the low work loads over here we thought we could do on the moon. And we were working as fast as we could, and we were putting up the ALSEP as fast as we could, we were collecting rocks as fast as we could, yet we could never do it, except in those two cases, to get the heart rates ... to go up. Not able to do that much work for some reason. That's ...

CONRAD Yes. We did all our EVA training, because we were so uncomfortable, as fast as we could do it. By golly, we did it about as fast as we could do it up there which turned out to be pretty close to the right time line, but when you added in all the unusual things that happened up there we managed to stay on the time line - -

SPEAKER That's right.

BEAN - - which tells me the actual - Each test that we performed took about the same amount of time, but it was all the goodies in between that spread it out over a longer period.

SPEAKER Yes.

CONRAD Like getting the fuel cask out.

SPEAKER Yes.

CONRAD And we got behind - In between the gee whiz and adapting, we got a little bit behind in the very beginning. And we ran into some unusual things right away like ... color

CONRAD (CONT'D) chart, raising the flag, and then we knew darn well ... the S-band, and Al spent some time with that TV camera and I think we wound up 6 minutes behind when we started the ALSEP and then that went pretty well ...

BEAN Very well.

CONRAD We had some unusual ones out there, but they were all things that we figured before were going to give us trouble, and they did.

BERRY Well, this suit time business - the thing that - The feeling that we have from looking at what's happened, both here and on 11, is that the limit seems to be more the kind of thing that what do you have in the way of capability to get fluid intake and to get fluid out. That seems to be more the kind of thing that limit and then just the fact of how long can you really operate in a suit, not because you're going to be - going to run into any physiological limit, but just due to general fatigue of a suit operation, just working, spending all that time in the suit. So I think those two things now - the thing that we don't understand totally yet is why you - It was very interesting to us. We were quite aware that you guys couldn't possibly believe your heart rates were running what they were running up there and you were able to - you know, you were doing perfectly well, so we weren't concerned about it, from that point of view but - It's an interesting thing that you do run a higher heart rate apparently than what you're aware of. And we don't know exactly what that means to us physiologically yet, and we're just looking at that and that's an interesting finding to us but that doesn't say, you know, this is the limit of what you can do here. I think that's - the point is - it's an interesting thing - -

BEAN I always - I always run the extremes anyhow on heart rate. I power down to about 48 when I really relax and 160 is not unusual for me. I'm sure that a lot of the EVA work ... had you had telemetry on me you'd have found that I was really working down there ... - -

BERRY Probably everything.

BEAN - - long periods of time it was over 150 or 160 and I could tell in that case, but I was sure fooled up there. I still find it hard to believe I got up to 170.

[redacted]

BERRY Do you remember the one time you commented about you could really feel your heart beating?

BEAN Well, that must have been on the run.

SPEAKER That's right, it was on the run. You said "Boy, I can feel my heart pounding now," and that was on the run. It was right near the end of the run there.

BEAN It also happened to be uphill most of the way. Very gradual, very gradual slope uphill and it - I don't know what the difference was but we ran a pretty good clip.

BERRY Well, we'll go - before - we'd like to go over tell you what was found in data as much as possible before you get out so when we - we'll tell you what we know for release data and we'll also by that time have some of this stuff on the EVA's so that before you get to the press thing afterwards you'll know everything we know, anyway.

BEAN ... We kept thinking that the work up there - let's say, deploying the ALSEP - was so much easier than it was in 1 g back at the Cape and we didn't know what our pulse was in 1 g back at the Cape. We thought we were running fairly low, I bet if you put the sensors on us back there at the Cape while we were doing that ALSEP in one g we'd been running up around 155 or 160. It's so much easier there to do the job than it was at the Cape; you weren't carrying all that weight.

CONRAD I'm sure there's 20 on there for just the fact that you're on the moon.

SPEAKER We kept adding a few all the time. (Laughter)

BEAN Hey, did our traces climb up like this or did they come back or what did they look like?

BERRY There was some oscillation, but the total level was - if you tried to draw a line through the whole thing it was high - it was higher - like we graphed the first EVA and the graphed the second one on top of it and there's a DELTA of about - Oh, it varies 20 to 30 beats.

CONRAD I guess we were right.

BEAN Yes. I said we were ...

[redacted]

CONRAD I think this is one thing you got to consider. I think that, one, you're always going to run and whatever roughly the individual - whatever the level was Al and I ran at and it could be that to keep a guy out for a long time and he's going to travel for some distance that you're going to have to have a limit like every 1200 feet, just flat stop and rest for 2 minutes if you go running over 1200 feet. It was always in my mind that I had to wind up at the Surveyor crater and calling out a time and I kept glued to the ground and they finally started telling me you get 27 minutes at sharp crater or something like that. I fell out, got to go on, let's go to the next one and that was always on my mind to get around that circle.

BERRY Well, you know that's another interesting thing, your comment about the resting because we - when you did rest you said if you stopped for a minute, it was probably less than that, when you did stop for these periods you said you felt like - okay, it was - you're ready to go again. You never really got that heart rate down during those rest periods, which was very interesting. We kept waiting for the heart rate to drop off, you know, and it never did during those rest periods which is a sort of interesting thing, too. So your old heart doing all this work and I think that's an interesting finding to us and what we really want to see is you know, can - You can go a hell of a long time this way maybe you have to just say there's going to be periods where that you just are scheduled because you're not going to be aware that this is going on over a long period of time.

CONRAD Boy, one time we had a rest and you didn't see our heart rates go down. Just as we came to the Surveyor crater just before we started taking the pictures of Surveyor, you know we said ... why don't you take a break right now. We took a break for 4 minutes. We worked harder in that 4 minutes trying to get something out of that damn bag than we worked all over the Surveyor.

BEAN Yes.

CONRAD I wouldn't be surprised if the heart rate went up, we were ...

SPEAKER We heard you. (Laughter)

CONRAD Did it go up?

BEAN No, he's right about that one and there's another place where we were theoretically resting and we were working our ass off was at halo crater when we had camera trouble.

CONRAD Oh, yes.

BEAN All that time theoretically we were standing there resting but we were wrestling with this camera and changing out the magazine and both of us were working standing still. ... we were working with our hands then and messing around with that camera. As a matter of fact, I found it very difficult not to do something even when I was resting. We always had something we ought to do, so ... when we said we were resting there were very few times when we physically stood and didn't do anything.

SPEAKER Yes. This is one thing we were going to - we started to tell you - we were going to try at one time to say "Stop doing it," because we could tell there was something going on all the time, like you were monkeying with the camera or something every time you had a rest period. And we were going to say one time just stop, don't do a thing, just stand there and let your hands - and see what happens - see if we could - if it would drop off that way.

CONRAD That's probably a good point but physically I don't care how long wou're going to stay out, the EVA's are going to be planned just like the flight plan is and you're going to have a plan to the match and what you're really hoping is to get it all done and not waste any time. I mean that's the standard procedure. And there was - there was no time that we were out there that there wasn't something that we couldn't think of that we ought to be doing to get the job done. And in that sense I'm sure that we - really not - rest. We've got one part and the other part ... Probably the heart - that's the interesting part, I think now that you can think about it, we did work a lot harder on the second EVA. We were always rushed and we'd run until we got to someplace and we'd work trying to collect those damn samples and when we got them, then we'd run right on to the next place. We ran all the way up to sharp crater and then while we were there ... digging the ... bottom of the ... bag, and all that was work.

BEAN Yes.

BERRY Okay. Well, we'll get back with the data and show you those curves and things sometime before the end of the time if that's okay and we'll go on. Let's check one - I think Clarence checked this and I just wanted to get it back on the - on the record again. About - Did you have any impression, any one of the three of you, about increase in urinary volume and frequency during the first few days of flight?

GORDON Well - Increase over what?

BERRY Over what you would normally do on the ground. Now, of course, you've got to relate this to intake too, so if your intake was up, and I gather that you felt you all drank pretty well, so -

CONRAD Probably. I tell you I go about the same amount up there as I do when I lay in the simulator at the Cape and that's more frequently than I normally do, but I don't think I go as much volume wise. You know when you lay in the simulator at the Cape on your back, you get overactive or something and I'm forever in an hour and 15 or 20 minutes in that simulator at the Cape, I'll leap out and go have a cup of coffee, and go to the head, but I really - it's not like the amount of volume that I would store by sleeping overnight. I'm really full but I don't - I feel about the same as when I've been laying on my back in the simulator for 2 hours - and I don't put out as much when I'm in the simulator. I go more frequently now. I probably went more frequently than these guys did but not as much.

GORDON I have a feeling that generally I urinated a lot more than I normally would, but at the same time I think I drank more than I would.

BERRY Yes.

GORDON I never get up at night and go to the john. I got up every damn night to go to the urine bag.

CONRAD Yes. I think all of us did.

BERRY During the whole flight, not just at the first of the flight?

CONRAD During the whole flight. I always had to go ... never did.

[redacted]

GORDON I never noticed any particular difference between the first day and the last, personally, as far as urinating more or less or drinking more or less. I had the feeling it was a fairly constant type thing. I have no way of relating intake to output.

BERRY Yes.

GORDON It's just a very difficult thing to do. I think we all drank ... It seemed like Pete and I did almost the same thing we did on 11; we took a drink of water, the water gun was passed around. One guy grabs it and starts to drink, it kind of triggers your mind to "Gee, I'd like to have a drink of that, too." That cold water was great. There were no bubbles in it or anything. It really worked well.

CONRAD I think I lost 8 pounds on 5 and I think I lost 2 pounds 11, maybe a little bit more. And I ... ... 2 pounds, and I was really in the chow. I never ate on Gemini and I ate everything in sight and it tasted great. I ate everything in the LM, and I ate all his food, he wouldn't eat it. I ate everything.

BERRY Well, on Gemini, on that 8-day flight, you know, neither you guys ate worth a damn on that, you sort of vegetated.

CONRAD ... on that flight.

BERRY Yes.

CONRAD And I bet I was up over 18 or 1900 on this one.

BERRY Yes, yes.

CONRAD I - -

HAWKINS Let me ask him about some ... ...

BEAN Well, I made a hell of an effort to drink a lot of water, all through the time we went down to the moon and we got back up. I drank a lot more water then I think I do on earth. I must have put out about the same amount of urine. I urinated every night, but I do that on earth. And after that we got back to the command module, I made an effort to eat a hell of a lot. As much as I could, as much, I know as much as I eat on earth. And then when we got back

BEAN (CONT'D) to the command module at the end of the EVA, I didn't drink or eat near as much after that. And I figure it's because I just hibernated. I drank when ever I felt like drinking; before that I conscientiously drank every time I could think about it, I was always drinking, and I wanted to keep my energy level up. And after that I did just when ever I felt like, which, you know, you don't feel like eating a lot and you don't feel like drinking a lot. I did anyway. So I didn't - I lost a lot of weight.

GORDON Al really powered down on the way back home.

BEAN Yes, I did.

GORDON He really did. Really relaxed.

BEAN Wasn't doing much.

BERRY But you didn't feel fatigued. I mean that wasn't, were you tired?

BEAN I had so much sleeping time it was unbelievable. We just don't have a thing to do. That 3 days coming home and 2 days going out is different, you got something new to look at.

CONRAD You kept sleeping in the daytime.

BEAN Yes. There's nothing to do. You can't stand up there and look at those gages, nothing is happening to them. I had to do them for 7 days and there's absolutely zero, minus one. I wish I had a book to read. We needed a book to read or something. There's nothing going on.

CONRAD - - ... started to drop off I got down to 7 or 8 hours where I used to sleep the full 10 going out, or about 9, I guess, but - -

GORDON You never slept the full 10.

CONRAD Yes, I guess - -

GORDON You always woke up about an hour before it was scheduled - -

CONRAD Laid around every day. I spent more time sleeping lighter and - bothered me the first 3 days out, and just about

CONRAD (CONT'D) drove me crazy. I used the exerciser, but my back. Apparently guys have complained about their backs before, never bothered me. On Gemini, it was my knees that got to me on Gemini. My knees never got that tired out feeling or anything but we used the exerciser and everything. But I had the decided impression that my back muscles were drawing my back that way.

BERRY Yes.

CONRAD Like this.

BERRY Yes.

CONRAD Like this, and I was like this all time and I got some bad vertebrae back there anyhow, and it was just like I'd walked 20 miles that day, everyday. And it really drove me nuts for a while, but I finally got on that exerciser and I'd sit there and I'd pull them this way, and after about 3 days, whatever it was, I got used to it, I guess, or after I came back up from the moon I was never aware of it any more.

BERRY That has been reported pretty widely in the capability to move about, and we think it's got something to do with the postural status. That you assume a new postural state and your muscles have a different pull, and you adapt to that finally and I guess some of the rest of you did too.

CONRAD That, too. It was realized that everybody takes their clothes all off, you get square shoulders. Everybody got like this when you relaxed. You guys would be sitting down there with the crapper bag on the LEG and I'd look at it and you know, Dick really did look funny, his shoulders would come around this way, and they would get very square. They're not hanging down any more like - and if you looked at all of the pictures of the guys in their clothes, they're all sitting in the couches. We finally got to the part where we're really relaxing, this is really the natural way to be, your shoulders get pulled up. Al pointed out the fact, everybody's face was swollen, almost the whole flight.

BERRY You know, that's a fascinating thing because we've been looking for that since clear back early in the Gemini time, you know, and this is the first time anybody has really said if they could tell it. They felt it all the

BERRY (CONT'D) time, you know, but nobody's really been able to say they saw that before.

CONRAD It was the most obvious on Dick. I don't know, I couldn't tell myself looking at myself in the mirror. I could notice it on Al, but it was most noticeable on Dick.

HAWKINS Okay. We got to get some of those photos.

CONRAD I had the feeling that I had more fullness in the head the first day than I did on ~~these other~~ two Gemini's. I was always aware of it. I remember sort of discovering, talking with you, on either 5 or 11 in Medical Debriefing and really giving it some thought that it seemed very logical that it would be that way.

HAWKINS Yes.

CONRAD But this time, I was really, really felt quite - - and I don't know if that had anything to do with the fact that you're not as confined as you were in Gemini or what.

GORDON I noticed that one full day, you know, being aware of it, and the uncomfortable feeling. It's just like you're standing on your head.

BERRY Yes.

GORDON After about 5 minutes that's about the level you get to, that's about what it feels like. But 1 day is all it lasted. I went to sleep that night with that swollen feeling. I woke up the next morning and it was gone and it never returned or I never really noticed it again the rest of the flight. Twenty-four hours is - that fullness, the feeling of having a full face was gone, full head. But Al, of course, went by appearance, the size of the cheeks, the face. I noticed our eyes tended to bug-eye a little bit. And we all had bloodshoot eyes the first day. Like, you know, the blood was there and it was about right to the surface and after about 3 days, all three of us were that way. And my impression of sleeping, Pete hit the nail on the head. I just didn't - I sleep two times down below in Pete's sleeping bag under the couch, and both nights I didn't sleep nearly as well as I did as when I just put the couch out flat, and put the lap belt in the undershoulder arm box, climbed into the sleeping bag and that was mainly for warmth because it got cold at

GORDON (CONT'D) night. And you pull those straps down, and I don't like to sleep on my back anyway. But, that was better for me and it gave me - free to float inside that bag. I just slept in my bag and he slept in that couch. That's true I woke up several times during the night, and I'd look around, and then I'd go back to sleep again. Al's sleeping habits were different than either one of us. He'd sleep 5 hours, get up, take a sleeping pill, and then go back to sleep for a while.

BEAN I could always go back to sleep at the end of the day and just 5 hours later I'd wake up. There was only one night I could remember that I didn't take a sleeping pill and that's - I woke up 5 hours before it was time to get up on that one too and I said, I think I'll just lie here and see if I can make it through the night, and if I'll go back to sleep. And I never went back to sleep. I laid there and tried all sorts of - thinking about all sorts of things. Funny, everything changes. I found that if they - I could hardly think of anything but the flight. And I would try to think of something else and my mind would think about it for a minute and then I would be back thinking about what we did today, or what we were going to do tomorrow. It was really - you could hardly get any other thoughts on your mind. I couldn't.

BERRY Could he keep the ... on his mind. (Laughter)

CONRAD ... ... just about everything else but the flight. (Laughter)

BERRY You really got worried about that, huh? (Laughter)

BEAN I don't know, Chuck. All this points out individual differences as far as sleeping habits. Man, I would have been happier, I tried to do this. I tried to roll over on that couch and sleep on my stomach, which is the way I normally, actually sleep. And I'd just lay there and if I didn't get those straps down tight I'd be ... but I've put my arms down through the head rest, you know, grab the pillow, and I could relax better that way.

BERRY Yes.

BEAN But I just couldn't stay on my stomach on that damn couch the way the harnesses and the shoulder harnesses and stuff felt. I just finally gave up and laid flat on my side and didn't get to sleep.

[redacted]

BERRY And you said in the debriefing that you were tied every time, that you put the straps and things down, so you had some feelings of pressure from the thing all the time. Did it take you guys longer than the one night, on the very first night now, you got a pretty good night's sleep the first night because you were tired as hell. You didn't have any trouble just even floating that first night. You didn't have any feeling that it was difficult to get used to?

GORDON It - I woke up two to three times. It was a little strange, but I tell you what was bothering me was my back. And I kept waking up and getting ahold of my knees and, you know, really wanting - bend over that way. I just felt like both my backstraps were squeezing me down and they were pulling me this way, and I really had a crick in the middle of my back. That woke me up, and I kept doing that. As a matter of fact, I remember messing around trying to find some way I could jam my knees in the - I didn't care about the floating, but I wanted to get my back curved. I was trying to find some way to take my knees and hands and jam in that bag so I could pull my back this way for a while.

BERRY Did either of you have that back feeling at all?

BEAN I never did.

CONRAD I think I got a fairly weak back too. I've got to always be careful of it. And I expected this, been thinking about it because I had heard about it. Didn't bother me one bit. When I got back on Earth it bothered me for about 4 days, in that Mobile Quarantine Facility. My lower back was real - I was real weak and ... ... a couple of times when I stood up.

BEAN Yes, you were hobbling - -

CONRAD That's right. My back ... backache.

GORDON Yes, you were kind of walking like that old man going uphill.

CONRAD Didn't bother me on the moon though in that suit and that - usually that's the first tough go in that suit, but you can always try to stand it up. Didn't feel it a bit there.

BERRY Listen, we read this paragraph in here about these quotes coronal discharges that you guys were seeing and that completely stops us. Tell us what - how this came about and who talked to you about it and what you saw.

CONRAD We reported this on - somebody reported it on one of the earlier flights and some guy - I got the letter, paperwork somewhere. He shipped it down to me at the Cape about two things for the vhf radio noises which could be discharges from someplace in space. And the otheher ones were - I thought it was on Neil's flight - reported seeing flashes from the spacecraft - -

GORDON At night with their eyes closed, - or no - -

CONRAD They noticed it when they were awake at night and in the spacecraft was dark and they thought they were in the spacecraft. But, whoever this guy was didn't know that was a perfectly known phenomena. You could get discharge across your eye from gamma rays or something. So they add a bunch of things ... . We closed our eyes and faced the moon, you know, when we were orbiting it because it would be more - you get less discharges facing the moon than away from it. You don't have to be anywhere near the moon or anywhere, the first night out, bing, bing, and if you - if you keep your eyes closed and your weight down there and it's dark and you think about it, when it happens you can figure out, you can pin down that it's one eye. It's not a discharge that you see with both eyes, you're really seeing it with one eye or the other eye and you can see what kind it is. We have two kinds. I guess the particle either strikes the eyeball perpendicular or discharges parallel, and we get either a flash like that or we get a streak and that's the only thing I noticed. I either got a flash or a streak and I, for some reason, got more with my left eye than my right eye. But I could tell which eye it was when I was concentrating on it.

GORDON I'm trying to tell the reason you did was because where he slept was always on the left side of the spacecraft. ... switch ... and I caught all the right ones in my eye. (Laughter) ... electrical ... (laughter).

CONRAD They should have protected you, Dick, they should have all - they should have picked them all up.

BEAN I'm really surprised you didn't hear about this because we were asked specifically to experiment with this type thing and there are two pages in the flight plan. We didn't bother because we were seeing it every time - all the time. There's a paper now on this very exact thing, the ... phenomena that came out of 11 that Buzz and Neil talked about.

BERRY I remember their conversation about it.

BEAN They thought it was something, you know, penetrating the spacecraft. What Pete described is the exact phenomena that all three of us saw. You'd see a light, or just a flash out there, or sometimes there'd be a streak. And I saw them in both eyes, either eye and, I can't remember whether it was more predominate than the other. But I agree with Pete, it's a phenomena that you're not seeing with both eyes. It's not something external, its something thats - -

BERRY Inside.

BEAN - - discharging and coming across ... Apparently know better. Apparently it's a completely known phenomena.

BERRY Well, we've been looking for cosmic rays, you know, cosmic ray strikes, and heavy particles, heavy nuclei, that go through. You know we started that clear back in Mercury, taking photographs of the retina to see if you could see streak across the retina and stuff and we could never find any in there. And so we stopped that up early in the - by the end of the - -

CONRAD Your eye is,what, the fastest healer on your body and if its doing anything you're never going to see it by the time you get a guy back. The only way you're going to see it is if you photograph it right after a particle went by.

BERRY Well, probably what its doing anyway is hitting just a single cell and that's all it would have to do, particularly make this flash, to hit a single cell.

GORDON I saw it one night, I was looking at the ..., a handrail up above, the one right up above - I don't know where it went, it appeared you know right straight along the handrail for about that - I just happened to be looking at that and you could almost see ...

[redacted]

CONRAD That's right - just lie there and close your eyes and see one. If you open one eye and chances are you'd see it. You didn't believe it at first. We saw it the first night and anyhow ... from the one we heard and I asked Dick, do you see it ... and they said it had never been mentioned. You'd wake up at night and you'd say well, I think I ought to see something so you close your eyes and those rays would come in about 1 minute.

BERRY Let me ask you one more question about heart - oh here - -

SPEAKER Were these random distribution of these or did they seem to be fairly horizontal.

BERRY Okay. Were these things random, or did they all seem to be in one direction, like were they always horizontal or were they at random they could be at any kind of angle?

GORDON The streaks I saw were horizontal.

CONRAD I was going to say - That's interesting. Mine, it seemed to me, I had the impression that they were always roughly in the same place, and mine were horizontal. The horizontal streaks were always, if I knew where I was looking it always seemed like a horizontal streak, was a little bit above the center, and it always seemed to be from right to left, no matter which eye it was in. The discharges were more toward center and would be just like a pinpoint of light and it closed again.

BERRY Like somebody was flashing a light at you.

CONRAD That's right. Generally not too big a light at you.

BEAN Yes. It was a very small light.

BERRY Yes, yes.

SPEAKER Is that about the same for both of you? Is that the same reaction you had Dick and Al, the way Pete described it?

GORDON Yes.

BEAN Yes, mine were about 30 degrees horizontal, but they were coming - gee, I didn't notice them from the right or left.

SPEAKER That's pretty interesting.

BERRY Yes.

SPEAKER But about the same, they seem to appear about the same place?

GORDON Yeah - -

SPEAKER No?

GORDON The ones - the horizontal ones that I saw were generally above by the - -

BERRY Same way.

SPEAKER Yes.

GORDON - - generally high. I don't know that I can't exclude any, I can't remember. I just don't remember any of them being down in the lower part of of vision. They may have been.

CONRAD You see, Dick is telling you about seeing them with his eye open, and other things that he would center his eye on, the lights on the instrument panel. So I used to notice them the most when I was down in that sleeping bag. It was pitch black down there in the hole and it wouldn't make any difference whether my eyes were open or closed, but I could lay there for - you could kill time that way, say for a half an hour and either open them or close them and wait and sure enough after a while you'd get one. And then I'd sit there for a while and say okay, is it the right eye or left eye. It would take you a while to sort it out, but you could usually figure out which eye it was in.

GORDON Now you know what you're doing when you're supposed to be sleeping, huh?

BERRY Yes. (Laughter) There was a comment that you took each other's heart rates during the exercise that you were doing in the spacecraft. What did you get up to for heart rates during that exercise?

GORDON I never got over 90, but what we didn't want to do was get to perspiring.

BERRY Right.

CONRAD I'd say I got to 120 or somewhere. I was getting up to an adequate ... I got 30. It never got very high either and I guess I got lazy or something. I didn't feel like I wanted - I worked pretty hard, it just about as hard as I wanted to work and I'd feel my pulse hoping it would be about 160, you know. Because if you worked as hard as you do in the gym, you'll go to 160 or more. It wouldn't be, it'd be down around 120 or something. Maybe that's the - affects you out on the moon.

BERRY Yes. Right. Let's talk about this plugging business that you had. Apparently, the plugging of the nose, from the story that we got, the only - we thought that at various times it sounded like Pete was in the command module and then - you know, that's a typical thing that we think at one time or another all of you were on occasion like you sounded for awhile on the COMM and we've had that happen before. It sort of comes and goes, which we are pretty convinced is an oxygen thing because we see it on the ground, too. Now, apparently, though, what you had, Al, was really more than that just prior to the time that you wanted to go - that you guys went into the LM to go on down to the surface. Can you sort of characterize that a little bit for all of you, what you had?

BEAN Let me tell you what I think was going on with me. It rather seemed to me that before we launched, by about 3 or 4 days, I could tell I was a lot stuffier than I had been for the previous 6 months and - I don't think I had a cold, but I don't know what the germs show, but I could tell I was a lot stuffier. Just as soon as I got up in flight after about a half a day, I really got stuffy in the ears and in the nose. I figured I blew my nose, in fact, I know.

CONRAD You blew your nose all the time. (Laughter) The reason I remember that is because we'd be sleeping and wake up in the middle of the night and he'd be just honking a hell of ..., it sounded like he was unloading a cork. You'd get up the next morning and you'd think ... in all these Klee-nexes he was throwing away. (Laughter)

BEAN That's right. I remember now. ... later, I guess. But you're right. Right at first I was blowing, I was real stuffed up. Now I wanted to stay clear for the lunar surface, so I took a lot of decongestants and I used Afrin, which seemed to clear it up for the period that stuff is

BEAN (CONT'D) supposed to work, 8 hours or 4 hours, and then it would start to close in again and them I'd blow my nose out. Okay, I seemed to get better.

BERRY Hey, you said you used Afrin. Now, could you make the Afrin work in the command module?

BEAN You fellers never thought it would.

CONRAD He's probably the guy that used all the goddamn stuff - -

BEAN ... you'd shake those bottles and you'd hear it - and I could get it out. Made me happy. Here's that damn cotton ball ...

BERRY Yes. Because I thought that you couldn't get the stuff to working up there with the Afrin bottle.

CONRAD I never had - if you take the regular bottle of Afrin spray down here ... hopefully you can get it to where it runs out your nose.

BERRY That's right.

CONRAD I never had the feeling ... ever get it wet. I'd squeeze and squeeze and squeeze on that bottle and roll that ... in every nook and cranny and I never had the feeling I was getting anything out of it. You know, when you take the bottle of Afrin and you spray it into your nostril and you inhale, if you're clear you can feel it on back - -

BERRY Down your throat.

CONRAD - - I never, never felt - we complained to Dr. ... and he opened up the medical kit in the MQF and the bottle, like that. They were all shooting spray out of them and I couldn't believe it. I thought all three of those bottles were completely empty. We smashed them, rolled them, squeezed them - I did everything I could to get it out of there.

GORDON I did the same thing, Chuck. I couldn't get any of the damn stuff out of there. Maybe a little fine spray was lining the nostril, but I sure couldn't feel it.

BERRY There isn't any reason why you shouldn't be able to have it go on down, you know, even in the weightless state. If you spray that in there, you could suck it on back.

BEAN What we were getting was awful thick ... I'm not sure it doesn't have something to do with 5 psi for that matter.

BERRY Well, we tried it. The thing that baffles me is that we took those things and tried them in a zero-g airplane, you know, before we did that to make sure that that stuff would work because we have had that kind of problem.

BEAN ... put it in a bottle because it can't spill. ...

CONRAD I never got any of it. I was convinced they were all bone dry.

GORDON So was I.

CONRAD I want some Afrin, I want some Afrin. Quit playing with it.

BERRY Well, we got to work on that one; we'll work on that one. Okay. The things that I gathered that you - did you think that this plugging business was worse than when you got - after the dust exposure for all three of you?

BEAN Let me finish. I had sort of, I thought - I got better as we got going into the landing part. And before we got there you could get into the LM for the landing, I thought my ears and everything were getting in a lot better shape. If I had a cold, which I didn't think I had, it had probably gone away. But I wanted to make sure and that's why I called up that night. I wanted to make sure that those ... were really clear. It turned out the next day that they weren't so clear and the minute we landed on the moon, must have been the g ... or something, my ears didn't give me any problem after that. I kept taking the decongestants and used the Afrin just to make sure, but it never stopped up. Now, Pete can describe his symptoms. But, anyhow, the day was good. We launched and got back to the command module and it started to stop up again and it's stopped up all the rest of the time. My ears are stopped up right this minute. I can't figure it out. I blow my nose, every once in a while I cough, and those ears have never really cleared worth a darn. I don't know what it is. I never had my ears closed this long in my life. They are stopped up right now.

SPEAKER ... polyps of some kind blocking the ...

CONRAD That ... I was stuffy the first day which I expected, but not blowing my nose, you know, everything was swollen up. I expected that and for the rest of the trip out until we got on the lunar surface, I was fine. Al got to use two and one-half boxes of Kleenex on the way out, especially at night he just lay there in that sleeping bag and honk away all night long. ... down there and watch, you know. Got down on the moon and as soon as we hit the g-field, I felt that, you know, I always have sinus trouble anyhow, I felt that that was great to be down here on the moon and have a little ... and first EVA and repressing the suits and doing the suit check and everything else, I was fine, but I got back in there after that first EVA and I started getting stuffy and I stayed that way and had to blow my nose and I felt it was the dirt. That second EVA when I went to pressurize my suit, I said ... my ear and I was in there my old ear drums were like that in there and pressurizing that suit and I was hollering and shouting and trying to pop my left ear. The right ear I could clear, but for the rest of the trip, the whole left side of my face, sinus, ears, and mucous, but all on the left side for the rest of the trip. Now, I attribute that to dust, but if Al had something, I very well could have gotton it. When I got on the ground in the MQF the next day, I got - coming back into reentry no trouble clearing my ears, but I knew I'd blown some snot up in that sinus and that's all it takes with me and it shouldn't surprise me at all to get an infected sinus. I had a good one; it was ... I tell you, the day that we came back, the morning that we got up from coming back from the moon, I really thought I had a cold and I felt miserable for about 3 hours, I really felt - -

BEAN - - went back to bed.

CONRAD I went back to bed. I didn't sleep well that night and I went back to bed and I slept about 2 hours while these guys worked. I really thought I was getting one hell of a cold. But that 2 hours' worth of sleep, it may have been that I was really tired. I didn't realize how tired I was. Coming back ... that night, probably ... that night. I don't remember too well.

SPEAKER ... lunar orbit.

CONRAD That's what I mean. But after I went back to bed and slept 2 more hours and got up, I was fine. I felt good and I didn't feel that I was getting a cold any more, although I was still stuffy. But for about 2 or 3 hours, I decided really that I was really getting a cold. But that went away.

BERRY This feeling was generalized aching, it wasn't due to localized symptoms in your nose or sinus or anything.

CONRAD That's right. I think Al described the same thing that he had. I would say that the stuffiness that I had and the way he was blowing his nose was just like having a cold without the rest of the symptoms. And my feeling was that one morning that I had all the rest of the symptoms of taking a cold. I had a headache, I kind of ached all over, and I made the remark several times, I said, I think I'm really catching a cold. If you had something, I've gotten a cold, but after sleeping about 2 hours, I was all right. I didn't have a headache anymore, I didn't ache any more, but I still remained stuffy for the rest of the flight on the left side.

BERRY Well, it appears that that's when that whole thing started and it is going to be interesting to see how much of that dust is involved with this thing. Did you get plugged at all in the command module, Dick?

CORDON No. I think I was relatively clear. I had that first day, a cold feeling, but there was ever any time during the flight when I felt that ... clear both ears. During reentry, I never even bothered with it. All the while this was going on, I did take some decongestant ... and tried to use the Afrin. I did this for ... preventative type thing more than anything else. I had this stuffy feeling, I never felt it was any particular problem in that area, but if there was something in there that was being passed around, I wanted to try to keep things clear and keep it that way for reentry. I went back and I did take this decongestant, but I never felt stuffy any time.

CONRAD Let me tell you why I think it was the dust.

BERRY Okay.

CONRAD Back in the MQF and got rid of this infected sinus Dr. ... gave me some tetracycline and got rid of that and I was flying the MQF when we came back here and the morning that we got back here, I unpacked all the Surveyor - That's why I think it was the dust.

BERRY Do you think that you got some pretty good inhalation products of that stuff? You think you got a lot of it down inside you in the LM?

CONRAD I'll tell you. The time that I got a good shot of it, and Al didn't, was when we got back up to the LM - to the command module and we docked, and we were getting ready to transfer all the gear and everything. The cabin was so full of junk floating around in zero g, I took off my helmet and I really blinded myself. I had cinders in my eyes, and that stuff was all over everywhere, and I told him, I said "Don't take your helmet" - you know, I put mine right back on - I said "Leave your helmet on, and we'll take our gloves off so we can work better and we'll have flow ... effects." The debris out of our eyes - it was my eyes that got full of debris, and I mean real cinders. I got one or two things caught in there and I was hiding up in the tunnel trying to get the junk out of my eyes. In the spacecraft was terrible, and he never did take his helmet off, and that positive flow kept all of that stuff out of the command module, and we never got -

BERRY Yes, I heard you say that -

CONRAD Also, we kept the hatch closed. I'd just pack one box in the proper bag, I'd open the hatch, and I'd throw it to Dick. He'd give me the LiOH and we'd replace that, you know, and I'd leave the hatch closed. All we did was open the hatch for as long as it took to get something across and we'd close it again, but between the two of us, we kept the command module real clean.

BERRY And you did take your suits off in the LM?

CONRAD Yes, and we just threw them across to him and he stuck them in the L-shaped bag cause they were so damn dirty.

BERRY Yes. Listen, we're going to have to stop because the guys are waiting out there to do the simulator debriefs with you and so we're going to have to stop, and the other - we got a couple of questions here still to go that I think what

BERRY (CONT'D) we'll do is, we'll try to put it in at the time - later when we've got to go over some of this stuff with you before you get out anyway. So, if you've got some time later that you want to schedule it, and if you're looking for something to do sometime, we'll do it whenever you want, but otherwise we'll try and do it sometime in the week when you're ready to - when we need to go over stuff with you anyway, and we ought to tell you what we're trying to do. To schedule time that, you know, that would be - the release time here, now, would come out at about was it 3:00?

SPEAKER 2:45 A.M. on the eleventh.

BERRY 2:45 A.M. on the eleventh. We think that is pretty ridiculous, and so we're going to get a reasonable hour. We're negotiating right now for a reasonable hour on the tenth, like in the afternoon of the tenth sometime, so that's what we're trying to set up right now. I think that that's probably what we're going to be able to do. So it looks good anyway.

CONRAD You want to - why don't you give Clarence the questions, if you want, and we can give you the answers that way.

BERRY Okay.

CONRAD Or - if you want them right away?

BERRY Good.

CONRAD I don't know what we have this afternoon - we can come back - we've got about an hour, we can come back after the simulator thing ... this morning. Is there something that they want to do? I don't really know.

BERRY Well, listen if you haven't - what we can do is check with the guys scheduling it so that - we don't want to scrounge some time from somebody else, but if you don't have anything and you're willing to do it sometime this afternoon, we'll go ahead and try and get it in and finish it, and then you'd be all done at one time.

CONRAD We'll come back this afternoon after lunch, if there's something real important.

BERRY Fine. Okay. ***Sent to me from Arizona, it's called the Popular Science Monthly of March of 1877, and there's an article in here that's entitled "Is The Moon A Dead Planet?" You'd really get a - it's fascinating to read this damn thing because it's got all this stuff in here about describing what, you know, what's going on the surface of the moon, and it sounds just like what these guys are saying today. Tell them they are 100 years too late. (Laughter)

CONRAD You mean we really didn't need to go.

BERRY You didn't need to go. (Laughter)

CONRAD It's not in the water. It pulled, you know, and it seemed to be developed in the heating process. I'd say that stuff is really pretty good. I don't know whether - we had a couple of hydrogen separator versus the cartridges. But it appeared to us that that hydrogen separator was doing everything before it ever got to the cartridges.

BERRY Yes, as I got it from the management debrief, you said that you thought that when you took the cartridges off, it was as good as it was without the cartridges for the last couple of days. But, you know, that paladium filter, the in-line filter, only takes out hydrogen, and we thought there was some oxygen in that water. And I don't know if maybe that's what you're getting in the hot water thing that you put it back when you heat it.

CONRAD It's in solution there, and it's in the cold water, and it sure doesn't come out until you heat it up; but God damn, there just wasn't any air in that cold water stuff at all, or any bubbles in cold water at all.

BERRY Hmm.

CONRAD You could mix up a bag of this stuff and - notheing.

BERRY Good show. Hey, I got - I got a wire here this morning from Dr. Gozinko, sort of my counterpart in Russia, that came this morning, and he says, "My heartfelt congratulations on successful accomplishment of Apollo 12 mission stop. Please convey sincere greetings to three moon explorers Conrad, Bean, and Gordon. Gozinko. So - greetings, and I'll send you a copy.

SPEAKERS (Laughter)

CONRAD He's in here listening.

BERRY (Laughter) Yes.

CONRAD What's he recommend for a stuffy nose?

SPEAKERS (Laughter)

CONRAD I got a good model here.

SPEAKERS (Laughter)

BERRY Oh, shoot! (Laughter) Okay, let's see, go back here and pick up. Did we finish the stuffiness as far as - we were sort of talking about that when we ended. I guess we finished it. Is there anything further you guys want to say, well, I think we finished it with the allergy bit, didn't we?

CONRAD Well, what did you think; I don't really think we had colds.

BERRY I don't think you had a cold. No, I really don't; and we don't have any evidence from it from any other sources that it was an infectious thing. And I don't think that it was, Pete.

BEAN Yes, and even if it had been, I'd have caught it.

SPEAKER Yes, I think the odds are - -

BEAN A symptom of something being generated - -

BERRY That's right.

BEAN - - and I didn't ever notice that at all.

BERRY That's right. I think that the odds are very great that you would have gotten some of the thing too, so I think probably the start of it was helped by this oxygen thing; and what you had for stuffiness at the Cape, Al, could have been some sensitivity stuff that you just picked up there. The Cape environment's not too different from here. And what happens in the oxygen environment will irritate any kind of respiratory thing that you have, and you do get swelling of the tissues and they get boggy in the oxygen environment. And so I'm sure that's what happened to you initially up there. Then this dust I'm sure helped the situation.

[redacted]

BEAN I got pretty good for awhile and then we got the dust problem and it got worse again.

BERRY Yes. Well, I'm sure that dust probably - you know that stuff, we're sort of interested too because it appears that from everything that you've said, and we covered that, I don't know if there's anymore you want to say, I heard the stuff you said about it in the management debrief and what you said real time, plus what you've done in your written debrief here, and it appears that we've got a real problem with that dust as something to handle within that system, and the procedures and things that we thought we'd worked out that were really going to take care of it, in fact, between us, some of the things that we have said previously prior to 11 to the committee just aren't so. You know, this business about what the cannister's will take out and all that, that sure doesn't look to be ture.

BEAN I couldn't believe that stuff wasn't being taken out by at least the lithium hydroxide in the command module.

BERRY Yes.

BEAN Well, we know it wasn't bej ause, you know, that blue hose on the left side is blowing right on panel 8.

BERRY Yes.

BEAN And that thing looked like it'd been stowed in the attic for 50 years.

SPEAKER (Laughter)

BEAN That's what it looked like.

BERRY Well, that's pretty obvious, then, that that must not have been going through that way. Okay. Let's talk about this work-rest cycle business a minute, because that's been alluded to in several things that you've said, but we'd like to get some idea about your feelings of that kind of a schedule. I mean what you were able to do preflight was only stay on your normal sleeping time, suddenly you got in flight and you had an entirely different kind of a schedule to look to. And I'd like some comments from each of you about the kind of things that you felt about the capability to work and perform when you were doing it at just the reverse of what you should have done according to your normal metabolic clock.

BEAN I think the smartest thing we did - I think we all recognized this to get on this reversed diurnal cycle, if you will, was extend that first day to be as long as we possibly could make it. I know from other experiences, even this particular one here, when you first get up there in that particular environment you're excited and things are different and you'd like to look around, and you're just not ready to go to sleep.

BERRY Right.

BEAN And I think that one single thing, in itself, probably helped us get over on this reverse cycle, if you will, when we are working at night and staying up in the daytime. And if we had tried to dibble at that piecemeal, I think that we'd have really been screwed up, but the fact that we stayed up so long that first day, and really didn't go to bed until we were all really tired, I think helped a great deal to establish that. As far as beyond that point as far as the work-rest cycles are concerned, the 10-hour sleep periods, turned out, were more than adequate. And we used part of that time to, you know, chat in the evening and get things squared away, and do the housekeeping functions and so forth; and we still woke up naturally about an hour before the end of that thing. We just knew the ground wasn't going to bother us, we woke up and did our morning chores, if you will, in the same place, we just did the day's activities, clean up, get the spacecraft restowed, and all that sort of thing; so that wasn't any particular problem with that particular cycle. I noticed one thing in my own mind, that the days, the waking hours, are just goddamn long. You just worked a long time. You put 10 hours of sleep in there, it's still 14 hours of work, and I don't care, when you're awake, you're going to be working. It's not an 8-hour day and you come home and - -

BERRY Like here.

BEAN - - you go to bed. It's just not that type of thing. When you're there in that environment, as far as I was concerned, I felt I was compelled to work 14 hours. We were out an hour early, that's a 15 hour day. And those days are just long. Fortunately going out and coming back, it's not really a particular problem, because you can go ahead and say "Here's two hours in the middle of the day," if somebody wanted to lay down and take a nap, they're perfectly free to do so.

CONRAD You're pretty loose on your scheduling going out and coming back, and I would suggest - one thing that's peculiar that you don't normally do, is you don't normally eat dinner right before you go to bed.

BERRY Right.

CONRAD And on the way out and the way back we used similar activities so that you can eat when you got up in the morning, and then you went to normal time to lunch and then you went to normal time to dinner, and then you didn't go to bed right away. That always for some reason bothered me. I guess the one other thing that I noticed that Dick's bright idea - well, I agree we did the right thing to stay up late the first day. The second day, I really got sleepy in the middle of the day, and the tendancy there is to nod and fight with everything in the world not to, so that I'd, you know, go to bed the second night at the right time and not have slept, and I tried very hard on the way back even to stay on the right schedule. I was teasing Al, there, about that he was able to sleep 20 some hours, but I could never do that, so I always tried to stay awake in the daytime, but a couple of nights I did fall asleep; so did Dick. During the middle of the day, there was nothing going on, and we'd be laying in the couches there getting logged. But that's kind of bad news.

BERRY Yes. Did you have a feeling that the three days that you had to get out there, and then all three of you had some activity which was sort of demanding then for that next time period of the lunar orbit and the lunar surface activity time. Did you feel that that time was enough to get used to that business so that when you were doing something at a time which appeared to be midnight and 2 and 3 in the morning and so forth, that you felt - did you feel like you were powered down, and you were having to push yourself to do something?

CONRAD We had the time in the spacecraft, and what time on the flight plan, and what time it was back in earth, and, really, we forgot that pretty quick. And we made some comments and teased the guys on the ground a couple of times, but we really lost all track of time on the ground. I'd ask Al what time it was, and he'd look at his watch and say, "Well, it's 3 o'clock. Let me see, I don't know whether it's 3 o'clock in the morning or 3 o'clock in the afternoon." And we really got on our own little cycle up there, and I think that was adequate. I don't think we

CONRAD (CONT'D) ever run into a situation where we had to work, like you're talking about. I mean, we were sleepy or felt like we needed to work late at night in the simulator, so.

BEAN I never had that feeling at all. The only thing I had was different, sometimes I wanted to go to bed, and I didn't go to sleep. I was always waking up during the sleeping hours. I'd think I had something to do.

GORDON I think there's an area of responsibility here that I felt on. Pete says we took 10. Now I don't particular remember myself doing that, and I very well may have done that during the day, but I particularly felt the responsibility of that transit time. I felt that that command module was basically my responsibility and the things, the activities that were going on regardless of who was doing them, I felt that particular thing was mine, and Al and Pete could rest and relax as much as they wanted to going out there. And I felt that's the way it's supposed to be, and I was geared to that and I felt that. Now, I don't know if that's indicative. I don't really remember catnapping like Pete said I did.

CONRAD No, you catnapped on the way back. Nobody catnapped on the way out. I mean meeting a normal schedule ...

GORDON That was kind of a - I knew that, to get those two out there, because they were going to be doing all the work, the majority of the work for the two days regardless of how long anybody stayed up or anything. And I felt that particular division, and I felt that was the way it ought to be.

SPEAKER Right.

SPEAKER Good.

CONRAD I don't - just to go a little bit further, I don't think there's any danger, like the days we had, the SEP day and the next day that we had, I don't know how many hours we were up each day, but I think we could have gotten many more hours than we did since we were able to insert a rest period in between. It is evident by the fact we got to bed late on the lunar surface. We got up early the next morning, we were ready to go. You've been trained for a year and a half, and you've flown out of here with 5 days, you sure

CONRAD (CONT'D) don't want to sleep. And - I don't think we were tired or anywhere near the limits of efficiency. I didn't feel a bit fatigued as far as being efficient. I'd have gone - -

BEAN I think about this fire overkill on the LM, though, if you put, for the 3-day LM, I think you ought to get the guys out of the suit, and you ought to give them a man's blanket, if that Beta cloth Mickey Mouse thing they killed us with, if I'd have slept in that it wouldn't have worked, but if you gave a guy a good roll blanket he could real - I had the feeling that I could've really slept in that LM if I hadn't been so uncomfortable in my suit. As it was, I conked out for a good 4-1/2 hours. And, really, I figured sure that I'd have slept, 7 hours is about my normal sleep time, and I'm sure that I would have slept a good 7 hours had I not been uncomfortable in the suit; and that's not the fault of the suit, I think I would have slept the 7 hours if it hadn't been screwed to my shoulders like it was.

GORDON I noticed one thing that, lunar activity that night after the landing, we had to change the flight plan so that I made that plane-change burn as the last thing of the day before I went to bed. You know it had originally been scheduled a rev earlier during their EVA or that actually was a time when they were actually outside, and then we had to delay it until they were actually back in gear at any time. Now, I personally felt myself that that was an awfully long day, and that was the only time during the entire trip that I knew I was hanging on the ragged edge for being tired. And I was so much overtired that I couldn't go to sleep right away. I had the real - you know how you get when you're extremely tired and you're beyond the point where you - you can hardly go to bed, - -

SPEAKER Yes, you can't relax, that's right.

GORDON - - and I was always having the muscle twitches in my legs and - -

SPEAKER - - I'd fall asleep, and then it would be this type of thing you know, the ... responses you get when you're that tired, and that one night was the one that I didn't go to sleep right away and probably didn't rest as much as I would've like to. Now, I don't know if it was the fact that we stayed awhile with a lot of activity going on up there, which hadn't really been done before, or the

SPEAKER (CONT'D) fact that - of course, that day was what? 8 hours? 21 hours?

BERRY It was close to 24 hours. Close to 24.

BEAN And Dick - Dick made an interesting point that, you know, these responses you have sometimes when you go to sleep?

BERRY Yes.

BEAN He had a - When you did that up there in zero g, ... at that bag I had the feeling I was going to ricochet right out of the side of the wall. I'd really do it though, the one or two times that I did it - I'd watch him in his sleep, he'd be up there sleeping on me in the bag, and boy, all of sudden he'd just shoot around and sort of ... And every night he'd ... and he'd talk sometimes too in his sleep. You really hit those things that - I knew that I know that that's beyond what you normally - -

BERRY That's right.

BEAN - - go to bed - -

BERRY You know that's a fairly frequent - if you get real, real fatigued, you get fatigued to the point that you're just really shot, you can try and go to sleep, and you just can't get relaxed enough to go to sleep. I mean, it takes a long time to power down, you can be so far gone you cannot sleep, that's all. And that's where medication can sometimes be some help to you.

CONRAD Well, I - I never go tired.

GORDON I've thought about that, that was the only night, that one night that I really, really knew that - Man, I was so glad to see that SPS burn over with - so that I could stop thinking.

CONRAD Now, the only night that I had really wanted to go to bed, and I didn't really finally gave up the ghost was ... ... thought you were getting that cold; you thought you were going to have a cold, ..., but I wanted to go to bed that night and I did early, right a way ... to get that ...

[redacted]

GORDON But this is not a - this is not a test point not to do those things, because I think in this particular case, you'd have to sometimes do a ... up those things, and you've got to not only physically but mentally prepare yourself to take those 20, 24-hour days if you have to. And we've all done this before. You know you can take just as much as anybody, you know damn good and well when you're working and you're on duty or something you've got to keep going. I think of how long or how many days you do this, you get to that break in there, when you get tired out.

BERRY Well, I think that's the important thing, that you got to be careful how - how - how long and how far you push and, of course, this interests us greatly as we look at these long-duration missions. It's one of the things we want to talk to you, the very last thing here. But I think that - the thing that we've all got to keep our eye on here for this sort of activity, is that there's certain things you got to do because we're forced to do them by the - by just the launch constraints and things that - that none of us like it, but we don't know any way around it, you know, we - we won't program this damn flight the way that it is, but there's no other way to program it, that anybody can tell you. Now, I think that that's, when you're saying that when you're there, you're going to - going to work, see you don't do a day like you do here. Like if you can leave here, you can leave work and you can go home, and you've got several hours like Pete says, you don't - you eat dinner, and, or you may go out to eat dinner, and then you've got several hours still where you've got some activity which isn't tied to what you're doing as work, so, it's really in a sense, relaxing time, it's - it's not sleep or anything.

GORDON ... to the entertainment, the relaxation break that everybody has in their normal daily living does not exist. You're awake. Up there, you're on duty.

BERRY Right.

BEAN I'll tell you another thing, if I could get that book, and ... tape recorder, you need that. Some of that relaxation.

CONRAD The - the thing that was different between Gemini and Apollo that I noticed right off the bat; nobody ever stopped moving when we were awake. You'd hang onto the

CONRAD (CONT'D) stride and by golly you'd go on like this, and somebody else would be pushing up and down with their feet or zip up to the tunnel and back to the couch and up again. And I'd look over and Al'd be punching his arm one way and just moving your whole body in there. And - let's see, I think that's one of the reasons, the fact that you're free, and everything, I felt a whole lot better than I did on any of those Gemini rides. I mean, I could tell I was going down hill a lot on those things, on every day that went by, it didn't matter whether it was a short one or a long one. But I never felt that way on this, I really felt good. But we all moved, and somebody was - You were always moving something.

BERRY Well, that's good, because that's one of the benefits we thought would accrue from having a larger spacecraft. And it has shown some differences from what we saw from Gemini, it's been better.

GORDON I felt better in 10 days in this one than I did in 3 days in Gemini, by far. A hell of a lot better.

BERRY Good.

BEAN There's also one thing, I think added to Dick's tiredness on that long day is the fact that he had to keep doing the same sort of work all day. We did the flying part of the work, and at kind of the end it was almost a celebration after 5 days of sitting in that spacecraft, to get outside and walk around and move your arms and do a little work, it was like going out and playing golf or playing tennis. It was a big change from the other kind of work and it was damn enjoyable. We got out there to that - -

BERRY That's good.

SPEAKER Good point.

BEAN - - never gave a second thought to the PLSS or the OPS or anything else. We just did the job that ... pretty good.

[redacted]

BERRY (CONT'D) I'm not kidding you, we ... those batteries in that tape recorder for everything they were worth; we had it planned out for the 9 days and we literally spent days - that tape recorder went maybe 8 or 9 hours a day playing music, and it should have gone more. I think it's the best thing we ever had and I - I - It ought to sound silly, but it did sound silly to me sitting down here now, but - And I've said it every goddamn time after the first flight that I went on, I was a dumb ass for not taking a book. And I started out to take one again this time, and I said, "No, Christ, I'm not going to get excited."

GORDON We were just going to - we were just going to flat smuggle in paper back books, put them in our suit pockets, and then we thought, "Well, ...

BEAN Yes, I was just thinking, you ought to put them in, put them in a little ... bag, and put them in your suit. You ought to face up to it and take the damn things.

BERRY Right. Well, I think we've got to face up now, as with the way we've learned, we're learning enough about the flight that I think you're going to have more down time going and coming and I think we ought to be able to face up to getting some recreation in there.

BEAN What you do is you leave a guy up there in the CSM by himself for 3 days. And then he's got - he's got - you know, you've left them at the moon for 5 days almost probably and 3 of them by himself, and then he's got 3 days coming home with the other guys, and I really think that he needs some good reading material, because there's not going to be that much for him to do. There's going to be things for him to do, but he's still got to have his relax time.

BERRY Right.

GORDON This was one of the recommendations that Stew and Ken both asked me this yesterday, and the worst thing of all - the worst thing of all he could do is stick that guy up there in lunar orbit and not give him some work to do. It doesn't have to be a 14-hour work cycle or anything else, but goddamn, he's going to have something to occupy himself.

BERRY Right. Amen. Yes. We sure agree with that.

[redacted]

GORDON Fortunately they were only about two or three rev's, out of the whole damn thing, I really didn't have anything to do and I made myself do something, and I took a lot of pictures at that time. In one rev, I just turned the camera on and watched sunrise - earthrise.

BERRY Did the COMM help? Did the COMM help you, Dick? Did you feel having the COMM was good?

GORDON That was - It helped tremendously, because everytime I had AOS, Ed would give me a briefing on what was going on; he'd bring me up to date on what transpired. And that MSFN relay was the best thing I had.

BERRY Yes. That sort of thing.

GORDON I just stopped to listen to it.

BERRY Good. That's good.

GORDON I know it - it's not a feeling of being left or anything but you'd just like to be informed what the hell is going on. I think it helped a great deal.

BERRY Did you ever really have a - a feeling of being - totally lonely? Did - did that feeling come over you at all in that time?

GORDON We've discussed it, I don't if you were in the room down at the Cape or not when we had our physical, but I had thought about this and - -

BERRY Yes. You and I talked some.

GORDON - - we voiced some concern, not - not really concern, but I was kind of curious at how I'd react to it. The simple answer to it, as far as this particular flight was concerned, that there wasn't any time that I wasn't occupied with something. I didn't have that so-called leisure time where I could sit and dwell upon my own miseries. Really. You know, it's not too far removed from the prison camp environment. You're stuck up there alone and - you know, what I mean is - -

BERRY Occupied, yes.

GORDON - - the ... and - you're by yourself, you sit and contemplate you're own damn misery, and you're out there so damn far away from everything else, it could have conceivably be a problem, I'm not saying that it is, and I don't think it would have been for me, I think it's a matter of the guy's own mental outlook on it. Fortunately, I had enough to keep me busy that that never seemed to be, never faced the problem really.

CONRAD These AAP fellows on 28-day missions and things like that are really going to need that recreation. I never pushed for it when I was working AAP, but, boy, right now I'd be in there hustling to get some good music and good tape recorders and some books, because they've got to have to do something; that 28 days is going to be a long, long time.

BERRY Well, we think for - I think this is the kind of thing we want for help on planning the advance. Maybe we just ought to ask you some things now. I think that the real feeling we have is that you've got to get a lot of things that are much more normal for the way you live here; you got to schedule your days as nearly as you can to the type of thing that you do here, so you got some down time, you can't work for 28 days every waking hour doing something. I mean, it's impossible.

BEAN That's right. That's why this - I guess that's why this - the way we work day by day here has evolved over the years. It's now become the natural way.

SPEAKER Right.

BEAN We need this amount of forget-this-flight and start thinking about something out there; you can come back to it in an hour, then you're always ready to come back, but it gives your mind a rest.

GORDON Pete and I were looking for our martinis before dinner every night, and there weren't any on board. I'll tell you.

BERRY Well, that's something I think we need to look for for 28-day flights too (laughter).

BEAN Sure be nice to have a martini before dinner.

CONRAD I'll tell you for sure, the happiest I saw Dick in a long time was the day we got back up to the command module. We

[redacted]

CONRAD (CONT'D) got in that ... and closed the door and he was so happy, he was dancing and jumping around.

BEAN We were pretty happy ourselves.

CONRAD Good old, Dick. I was surprised that he was as happy as he was. He was helping us out and fooling with our suits. Giving us this sort of stuff - -

GORDON It was amazing to me, I was really happy.

BERRY Well, listen, thinking about some of the long-duration things, now, for the AAP with a 28-day and a 56-day, and then - then thinking of Mars missions and this sort of thing, can you take some of your experience now and some of the obvious things that - that we know we've got to do something about, of course, are - we got to keep working on the food area, and try and get, you know, some way so we can have adequate food that will go for that long a period of time. By then, the waste management thing we think a lot of work's got to be done on, and think we've got to have even on these flights, I thoroughly agree as we talked about before you went, I think that we've got to start pushing the thing to get you some capability to wash in there.

GORDON Well, let me mention something about this waste - waste management. You know, everybody talked about their lack of desire to have a BM and this sort of thing. We talked about this a great deal back of the archaic blue-bag system and the lack of the john, and the - that was a North American john we had to begin with, and - And I think it's one of the things you just - it's like shitting in a sack here for you when you send it to the lab, these are things that you are not normally used to doing, squatting over a john and doing this thing. And I think Al pointed this out one night, we were both down there trying to have a BM and the thing that I noticed that helped me, is if I can get back in a corner and assume a sitting position, you know, without - -

BERRY Make it normal.

GORDON - - necessarily sitting, I'm sure I'd have been better off if I had a Church seat and I could just strap my fanny to it, I'm sure I'd have gone better.

BERRY Right.

GORDON But then, of course, you've got the problem of how you can handle it. Now, to me, personally, once the mental part of this whole process takes place, the damn bag didn't bother me at all, I'd just wait on till I had to go, and I'd just slap that bag on my fanny, and go. And it was no waiting, no fuss, no muss. But - you're putting - I think the key to this thing is - if you can make the guy's life as close to the way he's used to living, and provide the facilities, the easier it's going to be for him. Now, the further you get away from this, the further off we are in other things that are more difficult. And you can adjust. You can get used to these things. The fact that we had a new urine device, hell, we all preferred to go and pee in that urine device, even though it was messier. Even though it got urine all over everything, you pull that top off and press this little urine ball, ... we continually wet in the crotch, but the fact that we had something that we could put a stream of water into, just like we do here, made that whole operation seem a hell of a lot better, and it really was.

BERRY Yes.

GORDON It was a natural thing to do rather than slipping a ... on and peeing in the bag and then dumping her overboard.

BERRY Good.

GORDON I think there's a lesson there, providing those type of facilities.

BERRY What about the sleep thing, and particularly in - do you really, do you guys really think after that lunar-surface activity, you think we're going to be capable of a 3 days on the lunar surface in that thing?

BEAN Actually, I think you will be, I think they'll get good sleep in the LM. No, but it looks to me like the big problem is the dirt, you got to figure a way to get the dirt - keep the dirt from bothering your suit. If you can do that, you're going to have a good time there at the moon; it's okay, the sleep is good, the noise isn't too bad, if you can just lick the dirt problem. Did you see any others, Pete?

CONRAD I - I'm really - the noise, it may bother other people, noise didn't bother either Al or I, particularly.

[redacted]

BEAN It was like taking the country boy out into the city. Couldn't sleep when he hears the trains, and the cars the first night, but he does get used to it.

BERRY We could hear the noise when you guy's were pressurizing, boy - -

CONRAD Did you really?

BERRY Yes, we could hear it in the control room loud as heck.

BEAN You mean, repressing the cabin, now?

BERRY Yes, repressing the cabin.

BEAN It does, it makes a tremendous noise.

BERRY Yes, yes. But we didn't hear - I couldn't hear glycol pumps, or anything going though, like - we did before, we heard some of that on 11, but I couldn't hear any of that here.

BEAN Well, were they on VOX, or were they transmitting or not, that maybe the key there, right away.

SPEAKER VOX is likely to repress now that I think about it.

BERRY Yes. Right. You were on VOX. Yes. Then let's - let's get a word in about these - the way that this biosensor thing started with you. And one thing we ought to explain to Al, - we - we felt badly about having to go to you just prior to that EVA.

CONRAD That was the only thing that made me mad on the flight.

BERRY Yes. Well, we felt badly about that because what happens - everything was okay with yours until that - that time. All of the sudden, whap, we got into trouble with that just as that point in time, and so we were - we're arguing with ourselves about what to do and we were talking to the - with the flight director and Chris came down there and says, "Gees, you'd better go ahead and have them check every damn one," you know, I was going to stop, too, and luckily we didn't. We got you to look at that ... because that's where the problem - after the two and it didn't happen, I says, "Gees, we're going to lose them right here, and we - and we just got to stop them." And Chris said, "Hell, if you - if that isn't going to do it, you'd better - you'd better

BERRY (CONT'D) go and do a third," and I said, "All right, do the third one, (laughter) let's do the third." So, I think what maybe we need to do is - is take your suggestion and maybe it would be a better thing all the way along, is if you had some standard check time and said, "Okay, let's - let's take them off, clean them up, so that because with all the moving around you may get them dried out.

BEAN Right. I should have had mine at sleep ... I didn't have them on at night, sleeping. And that little baby was hot.

SPEAKER That's right.

BEAN Also, I think if you'd have been - it's obvious to me, now, if you'd have said, not only inspect the wires, but look at the tape and see if you see any of it looked different. The one that we finally fixed was the only one that - it was right here, and this - when you move this neck around this opened up the air, and might near dried this thing out. Now, if I'd have been smart, I couldn't see it but Pete would have said ... Pete says that looks open, you put that off first, and that thing was as hard as a rock. And I took it off, remember changed them back again, the thing was almost hard that day, too. So, right up in here it just opened up. They ought to put those things down below this level - -

BERRY Yes, wait just one. You know what the problem was there, Al. We made a mistake in what you said too, because what we were trying to say, the one that I said first, that I wanted you to look at, I thought was this one, I said the upper sternal, and what you really looked at was this one first.

BEAN No, I didn't.

BERRY Yes, did - you looked at the ground wire first.

BEAN At first.

BERRY Yes.

BEAN This one, and then this one, and this was the one that was opening.

BERRY Right. Well, see, this is the one we thought was the most likely, was the upper sternal, and that's why we said look at it first. And I thought you'd already looked at that.

[redacted]

BERRY (CONT'D) And I thought the third one, and I almost didn't have you look at the third one, because I thought it was the ground one, and I couldn't imagine that the ground lead would produce what we were seeing, so, boy, thank God, we did!

BEAN Didn't have any COMM with it. ... COMM, to have my suit off. Did you tell Pete the upper sternal?

BERRY Yes, well yes, we said upper sternal.

CONRAD Yes.

BERRY Yes. But that's all right (laughter).

BEAN Just let me make these comments here. Apparently there's enough - there's enough problems in this regard that - that I seriously question, wearing those things that long to begin with. I don't know

GORDON - - take the damn things off, clean them up, provide new material and put them back on again when you come to the point of requiring this type of information to make these judgments. I can't understand, and it was obvious during the flight, that we really need this stuff while we're sleeping. Do you really feel you need this type of data. Maybe you do. Maybe I'm off base, -

BERRY No. No.

GORDON It used to be that we could take that three-day coast period when we're really not doing anything and clean the whole mess up and maybe strip down and we'd feel better and your skin gets healed. We're all bothered by the damn tapes being on there and the irritations being around these things. Let the skin recover from these things and put them back on again when you need the thing.

SPEAKER This is one of the things that we're constantly looking at, of course, Dick. Now let me say something about the sleep data. Really, we need it, and of course, that was - one of the problems there, I think, is that that wasn't really worked out well enough ahead of time. I mean there were a lot of assumptions made and it wasn't really spelled out either with, you know, we didn't really sit down and say, "Here's what we're going to do," I guess, because we went back and thought about it, and couldn't determine we did.

SPEAKER (CONT'D) The sleep thing, particularly on the two guys that were going to the lunar surface, was important to us, because what we were trying to do was to get some kind of handle on how much change was occurring in them over this 3-day period and the best time to do that was when they weren't knocking around, to see what was happening to their sleep rates, how they were going down. And secondly, how they were doing as far as rest was concerned was important to us for that going-out period.

GORDON Thing of it was, I slept most of the time with everything disconnected and I was waked up every goddamn night -

BERRY That's right.

CONRAD We never understood that ... we kept questioning ourselves what possible good getting our sleep data could you. We'd say "Well, shoot, that doesn't have anything to do with what we do when we're working."

BERRY Yes. That's right.

GORDON You can't even zip up that sleeping bag when that damn thing is on, too - so you really you just have to ... and get into the sleeping bag. You can't get it inside.

BERRY Yes. What we were trying to do, see, that's data we were going to use to correct the curves that we had on you from your ergometry and that had never been made clear to you and that's our fault, it's not your's.

CONRAD We talked about it ... -

BERRY Yes. That's right. It's not your fault at all. And so we got to talking about that and that's one of those things that was pretty hard to start talking about air-to-ground. You know, you couldn't start having a big discussion air-to-ground. We said, "Well, I guess we better leave it alone." But I think, that is a point. The other point is that I think that there can be some downtime from the - which - so that we can alternate. Now I tell you, the sensors are - to have data on some - at least to have data on a single guy all the time, so that you know what's going and what's in the cabin. Now when you got times - as you say critical times - that's the time you ought to have data on everybody involved. Now, there are times, though where

BERRY (CONT'D) you want - you need a guy so that you know what's going on in there, and one of the things that happened to us, is that we lost the PCO_2 on launch you know, and we never did know - and one of the first things that happens to you in the CO_2 thing, is you can pick that up from respiratory rate and from heart rate. And here, we had some time periods when we didn't even have that, which was a, you know, we should probably have yelled more about that in view of not even having the - in having no CO_2 sensor at all. Because that really - that's protection for you. It doesn't do a damn thing for us, but it's protection for you is why we're trying to do it.

GORDON We weren't ever concern with it, but we didn't worry about those lithium hydroxide canisters. In fact, number 15, we changed that night, leaving the moon. We just screwed that one up and ... with it.

BERRY Yes.

GORDON So the next morning, I changed both of them. So you've got one canister there that's got double duty on it. And one that doesn't really have any on it.

SPEAKER That's that one.

BERRY Yes. Which night was that, Dick? That's one of the questions we had.

GORDON Canister change, just after leaving lunar orbit.

BERRY Okay. That's the one that you forgot.

GORDON Just flat-ass forgot it, Chuck.

CONRAD ... it was the night that we came up from the moon.

BERRY It was leaving lunar orbit, wasn't it?

GORDON I was going to say, let me look at the Flight Plan, it's written in there.

BERRY Okay. Good. Well, Pete, tell us about what you felt and exactly where these things were. Was it strictly under the sensor itself, or was it under the tape part too.

CONRAD No. It was the green - I mean the paste part. It all boiled up under there. I got these blisters, and I wasn't aware that the - all of them were doing that. The very top upper one, whichever ones that is. That's the first day out; that's only 4 hours out. It started itching and it was driving me crazy and I just kept ignoring it. Now, for a while, I thought that the tape paper over the top - it got all wrinkled up and had my skin all wrinkled up. So I sort of stripped that back and got my skin straightened out and put it back on again and I figured that caused the itching. I didn't want to scratch anyhow, so I just didn't pay any attention. I just tried to ignore it, but it just kept going and going and going and it wasn't until it finally came back up and pulled that one off that I realized that it was irritated underneath. All this time I thought it was irritation either to the glue or to the ..., but it wasn't that, it was right smack in the center. And when I took the rest of them off every single one of them, but I just looked like, I wanted to say poison ivy. Little whelps with fluid in them; like blisters, little blisters.

BERRY Did they have pus in them then, Pete?

CONRAD They had clear fluid in them.

BERRY Just clear fluid, then.

BEAN Yes, they looked like ... in my case ... poison ivy.

BERRY Did it on you - the same thing on you two guys?

BEAN I only had one place and that was right here.

CONRAD Their marks seemed to be more around the inner and outer circumference of the electrode. In other words, it looked like they were irritated from the glue, but it looked like I got irritated from the paste.

BERRY Okay.

GORDON I think the ones that I had - and they never really bothered me except I ... how look at them. The one the left, lateral, what do you call this one over here ...?

BERRY Yes.

GORDON It itched a little bit and when we pulled them off, right there, just a ring like that, right around the edge of it, was the little tiny red bumps, these pimples.

CONRAD Dr. Jernagan got some pretty good shots of them in the MQF.

BERRY Is that right, Clarence?

(Laughter)

BEAN Sorry about that.

SPEAKER Yes.

CONRAD That's the only camera problem we've had on this trip. (laughter)

BERRY Yes. That's right. (laughter) Well, listen, the thing that's happened with this bioinstrumentation we ought to tell you about. You know, that mentioned this stuff with the staph that you had this staphaurens on there, and Clarence described the things when he saw you, that you had pustules on there by then in the one, and Dick apparently had as much as anybody by then on that - at the end of the thing.

JERNAGAN He was the only one that had as much. I think the one on the left was the one that was completely green.

GORDON There were several.

JERNAGAN Yes. There were several up here on the very top.

BERRY Well, the thing that we got a - they put a - Apollo anomally RID in on this thing - the program office did - because of the reaction there, so we had to develop a plan - come up with a plan - you know, what are we going to do about it. We had the stuff shipped up from the Cape - grabbed up all the stuff and we got it up here, it's in bonded storage and so we're getting it out today. We're going to run some chemical tests on this stuff and some bacteriological tests, too, to make sure, is there anything different about that batch from the batches we've been using all the time. That's one thing.

CONRAD Before, I wore them for 8 days in Gemini and I wore them for three and then I've worn them plenty of other times and never had any reaction to them, but I obviously, for some reason, reacted to the paste.

BERRY Yes. That's the thing that I think is confusing to us, Pete. Now, one of the things you can do, over a period of time, of where - you can get yourself sensitized to it, so we've got two questions - we got two plans here - two ways to go over this thing. There's either something different about the stuff, which is one thing. We're going to look at that pretty carefully, now. We're going to do some chemical tests we're also going to do - look at it bacteriologically and see if there's anything different at all about either the tapes or the paste and stuff itself. And so we'll clear that up.

CONRAD Why don't you ship a sensor in right now. We'll put tape in it without the wire and let me stick up on up here and I'll wear it for you.

BERRY Okay.

CONRAD ***reaction to it. I don't -

BERRY Okay, that's what we'd like to check, but you beat me to the punch. We'd like to do that. We talked to the dermatologist, and Clarence can tell you about this, but we'd like to try that to see if you are indeed sensitive to this stuff because it is important for us to know it, for you to know it.

CONRAD Sensitive to it. I'll put it up here because that started - I don't think I got 8 hours into the flight when that started to itch, when I noticed it.

BERRY Put it in a new spot.

CONRAD I didn't pay attention to it - -

BERRY I'd pick a different spot than up there, though. I mean - -

CONRAD Okay. Wherever you want to put it.

BERRY Yes. New location.

SPEAKER Put it on your face somewhere, and then maybe on the back ... ... without being - -

GORDON I think you ought to go whole hog. I think you ought to tattoo him in the goddamn thing, just go all the way. (Laughter)

SPEAKER What about the other guys?

BERRY You know, what we need to do, don't laugh yet. We haven't told you guys yet. (Laughter)

BEAN I don't volunteer. (Laughter)

BERRY Well, we'll - I think that what you want to do is get a little patch of this stuff on there so you can see if you - which of the things - are you reactive to any of them and it will be real easy to tell on what - if you start reacting to it, we don't have to get you to where you get a pustule or something on there, we can stop it.

HAWKINS I'll tell you what I'll do, Pete. I'll wear one outside here myself along with you.

GORDON Maybe you want me to give you this information. You may want to write it down. We changed number 13, and it was canister 15 that we were to remove that we didn't. So canister 15 is another half cycle. That was the one we were supposed to change at 173 hours and we didn't, we forgot it and we changed them both then the next day. We got a canister in there with another 12 hours on it that probably would have been done and one canister, that's 17, that's only got a half cycle on it.

BERRY Good. We'll get that in for the analysis for the canisters. That'll be a good deal to know that. Very good. Okay. One other thing, I wanted to ask you about that tuna spread thing that came up. How long did you have that tuna spread open?

BEAN A day.

BERRY Okay. Now - -

CONRAD Nobody ever said anything about that. That reading that we had, I remember reading that make sure you eat the bread within 6 days and she may have said eat all the food

CONRAD (CONT'D) they can, she may not. I don't really remember. The one thing I always learned from someplace, I don't know, my mother or something, is that it gets rotten in a hurry. I was a little concerned about it just sitting there with the lid off. We had the plastic lid on it.

HAWKINS You know, I got the suspicion there one time, that Al had already eaten some of that when you asked.

CONRAD No. We hadn't - -

BEAN ... I ate the whole goddamn thing.

CONRAD Yes.

BERRY Afterward?

BEAN I ate half of it before he even asked and I said "Bullshit, I liked it before, so I'll eat the rest of it."

BERRY Did you? Did you really? Did you eat the rest of it?

BEAN I ate it all.

BERRY And you didn't get sick? (Laughter)

BEAN I said, "Hell, half of it. You know I'd like to eat half a ... myself, might as well finish it off."

BERRY Are you going to have - did you guys have a good case - - (Laughter)

SPEAKER I'll be damned. It's a wonder we didn't ... kill them with that damn stuff.

BEAN I don't know. It could have been bad. But I ate - One thing we screwed you up on - I screwed you up on was the sleeping pills the first couple of days. I took it the few days and Pete didn't know it but he was making reports in the morning, apparently said he didn't take it, but the reason he never knew it was because I'd go to bed without it, you know, and I'd go sleep. And I'd get up 5 hours later when I woke up and go get one, take a drink, and go right to bed, you know, and he didn't know I was taking one. So, about day 3 we said something and we guys were laughing about it and he said "I didn't know you took any

BEAN (CONT'D) sleeping pills." He said "We got to figure out a way to keep it undercover or they're going to be bent out of shape" and I said, I won't take one some day and we'll tell them I did. (Laughter) So it all averaged out.

CONRAD Al also changed his suit, you know. He told me he didn't like them before flight and I mentioned Dick and I weren't going to take them, and Al said "I'll never take one either." And for a few days I kept thinking "Man, that guy is really a sackout." He'd be down there completely flaked out. When we get up 10 hours later, I'd be down for about an hour tearing around and waiting for somebody to get up. He finally consented to getting up in the middle of the night and doing it so he could go to sleep the next 5 hours.

BEAN The only sleeping pills I've ever taken in my life the two you gave me to test and the ones I took on that flight. I'll tell you the next flight we take I'll make sure we got 10 good ones ... (Laughter)

CONRAD ... hoping he'd take them during the day (laughter).

HAWKINS I wish you had told us about it though.

BERRY Yes. You know the thing that we need to try and do something about and we need some help from you guys because maybe you can tell us how to get at it. We've always had a problem with this business about this medication jazz. About how - it's - you know, what the problem is, is trying - what we're trying to do is to be some help to you if we know what the hell you need and for instance, on that stuff, take an Actified, for instance, you really, if you stay on a schedule with this stuff, you know, you won't let yourself get blown up. You can keep the thing down pretty well and you can do that over a period of time if you schedule them all right. Now the thing that - that's why it's important, and it's important in planning ahead, because we can think of some things where you might get into some difficulty and say you ought to do this when we see something coming up in the flight plan, say, hey, remind them to do this. And we badly, we were trying to get some word up to you about the time of - going into the LM. But there was so much happening you know that's such a busy damn time, that we wanted to say, you know, "God, take some Actifed with you when you go into the LM."

CONRAD Don't worry about that Chuck, we - -

BERRY Thats - -

BEAN We knew we might need it, so we - I took it over to the LM.

BERRY Well, we were delighted that's what happened. I was really glad.

BEAN We called you that night. I got worried about the fact I might have even been taking too much or not enough. I wanted to make sure it was all settled before we got there. Apparently you gave me a good prescription because it all worked. When we got out on the moon, we ... Yes, we were trying to cut you in on it and not turn anybody on too much.

GORDON I think, if you want a very personal reaction to this whole thing, I think that's one of our big problems; if we take a goddamned asprin up there, it becomes an international incident. We object strenuously to it.

BERRY Yes. That's our problem.

GORDON And we just simply are in a posture here where we do not enjoy the normal doctor-patient relationship.

BERRY We agree.

GORDON Especially this flight crew, just flat-ass object to this type of thing. Now if we can convert, and be able to talk to you like we can right now, without the Jim Malone's or the Bill Heinz's or the rest of the world in on this god-damned act, we'd do it, but I'll be goddammed if I wasn't damn reluctant to come up and say, I don't know why, maybe this is just a personal thing with me, but I'm sure a lot of the other guys feel the same way.

BERRY Yes.

BEAN I feel the same way.

BERRY No, it isn't a personal thing with you at all, Dick. It's true.

GORDON Get in the posture where these things aren't flags as a goddammed potential space problem and saying you ought not to be there because you got a headache, or you ought not

[redacted]

GORDON (CONT'D) to be there because you got a sinus problem, and all that crap that goes along with it; then I think we would feel more free to talk about it.

BERRY Yes. Well, let me say we had a hell of a battle about this, early, you know, two or three flights ago. We got all the way up to Paine, and I had gone to Chris and Deke, and Bob Gilruth, and gotten them convinced that we were going to go in and ask that we have an opportunity to talk once in the morning and once in the afternoon, or any other time that you need to, like if you got something happen to you anytime, we could do it somehow, but we wanted to try and make something routine so that it didn't become a public flap, you know, when you have to talk privately, because that's the same problem you got now, if you say you want to have a private conversation, well, yes, it becomes a big public thing just the same as you went ahead and said you were taking the stuff. So what I was trying to do is get it done routinely so that we could maybe do those things then and you wouldn't have this public thing, and we thought that would help greatly in doing the very thing that you are saying, because I feel the same way. I think it's a stupid goddammed way to try and do business. I mean, you just don't normally do that, and it's foreign to us and we feel uncomfortable and teed off about it just the same way you do. And so what happened, is it got through Sam Phillips and he agreed, and he went to Paine with it, and Paine, apparently through Sheer's intervention, Paine woud not back it. And he told us that we couldn't do that and he laid down rules for what was going to happen with private conversations, and we've never been able to turn that over. Now, I think - Just why I'm interested, if you guys tell me, see, what we can do is go back now and I've been trying to just wait for a few missions and see would happen, and say, "Look, this is really a medical problem, damn it, and we think it is something that ought - that we could solve that problem and be better off as far as the crew is and be a lot better for them as far as trying to do the job we need to do for them, if we could get this sort of thing.

GORDON I don't think you'll ever get to that. I think we're caught in the middle of this particular thing right now; we'll never be able to have a private conversation - -

BERRY Yes.

CONRAD - - argument. I wanted a private conversation every morning, even if it was really nothing, just the right we had to talk to our bosses.

BERRY Right.

CONRAD - - and ... told Walker that, that same thing as you were talking about and I told ... and everyone else in the meeting and I said I would not initiate private conversation on board the spacecraft. I'd die before I'd do that - -

BERRY I remember that.

CONRAD Because it becomes a ... emergency. And if we had a problem, we tend to fly it out because it's a problem anyhow. And I don't know what you're going to do about it, either; I'll tell you one thing: There's no doubt in my mind that you are going to get guys sick up there from zero g and everything else. We're going to fly more poor guys who haven't been up there; of course, the three of us adapted and didn't have any of that problem. But you get another Rusty up there or something and you're going to have to do something about it, because he's not going to know whether he's going to be up to speed for the moon or not.

BERRY That's what worries me, Pete; see, that's the real concern that I've got. And that's where I think it's unfair to the crews and it's unfair to us who are trying to do something to help them, because we're hamstrung if we don't know what the hell's going on, you know.

CONRAD We all maintain the same thing. We didn't initiate any private conversations. But, God damn, if Jim Maloney and every other son of a bitch in the world can go talk to his editor, well, he ain't going to fight the public then. And I figure that we have the right to talk to all our bosses. I think we ought to have a private conversation every morning with the Flight Director, Chris, the Program Manager and anybody, if you want to talk about something. I don't understand this why we've got to say every freaking word we say publicly but any other son of a bitch that's argued for his first amendment or whatever the hell it is, goes into that so-private conversation. So I'm not going to ask that the - I've been waiting for one of those reporters to say something to me. Because I'm going to tell them right out, just that.

[redacted]

BERRY Good.

CONRAD Jim doesn't invite the public into his editor's office when he's talking about how he's writing about the space program, neither does Bill Hines or anybody else, yet they bitch like hell when we want to have a private conversation with our boss. And if you call for one, now, that connotates an emergency right there no matter what the hell you're calling him about.

BERRY Right. Exactly. That's exactly right, see. Yes, that's the problem we got right now. And the only way you could ever overcome that is to do it on a routine basis so that there is time set aside routinely that you're just going to do that, by God; and you tell the press and everybody ahead of time it's none of their damn business.

CONRAD That's the only way it'll ever happen, Chuck. We can't do it down there; it's got to come from the bugs up in Washington. We've got to flat tell the world that, "Goddamn it, we're going to talk to these guys for a half hour a day, and you're not going to know what we say, and screw you." Why not do that?

BERRY I agree.

CONRAD I told them before the flight I would be real surprised if one of didn't slip and swear up there over the air, you know, when we were on hot mike.

BERRY You did very well.

CONRAD God damn if I'd apologize to any son of a bitch. I wasn't going to pull a Gene Cernan, and if I was going to swear, why, screw them, you know, you're not going to satisfy everybody in here.

BERRY That's right.

CONRAD George Lowe had the best idea of all. I think the networks really screwed themselves. He suggested that they put the - -

BERRY The cuts, yes.

CONRAD - - dad-gum blame on themselves and let them do it. They came back with this radio statement about when they put out their own show, that they had to right to do that, but they didn't have the right to censor our public conversations, which is a bunch of horseshit.

BERRY No, but they'll sure interpret the hell out of it.

CONRAD That was the real reasonable way to go. We weren't withholding anything from them. I can't believe that the public has the right to know any medical information that you hope - that - -

BERRY I agree.

CONRAD When he goes to the goddam doctor, he doesn't want the doctor talking about, "Oh, that's all right. He's quite obviously, he's got a case of the clap," you know. It's nobody else's business but yours and the doctor's.

BERRY That's exactly right. And, as a matter of fact, the freedom of information, you know, this business that we're all under now, about some guy, any private citizen, you know, can ask for a document or something, you know, or can ask for information from a government facility, and there are a lot of things you cannot withhold from them, you've got to give them; well, the one thing that you can withhold is medical information; and it's specifically spelled out in there, it says that. And so I think we've really got to do something, and I'm going to keep fighting this thing, and I just want you guys to know, and it helps to have you say it again, even if you just say it here; it helps to know that, that that's a problem.

CONRAD Well, I feel that we were pretty damn honest with the medications we took and we were telling you everything. We didn't admit, not intentionally, the sleeping pills that Al was taking. We were really trying to figure out how the hell we could best to bring that up to date, and I guess the end result, we'd tell you about it when we got back, but I'm sure you would have rather known about those things in flight. I think our agreement was with Dr. Hawkins before the flight was a damned good one. We could take a couple of asprin if we felt like we needed it before we filled out a report on that, and then report it when we got a batch of them. I did take some asprin up there, and I really don't know. What was the editor's count? I don't

CONRAD (CONT'D) know what's the big deal about that. I'd hate like hell to have to call down and ask to take two aspirins, because whenever I get a headache that's my whole body telling me I'm tired.

BERRY We don't want you to do that. Right. No, that's why I thought, you know, there are some things that I think we can plan ahead of time that they may be things just like taking the antimotion sickness stuff preentry if you feel there is a need. We can say that ahead of time, have it all programed; there is no reason to have any problem with that. Nor with the asprin.

GORDON I don't think you need to do that.

BERRY What?

GORDON We all really don't think you need to take that particular one.

SPEAKER The antimotion?

GORDON Huh?

SPEAKER The antimotion?

SPEAKER Well some people do, Dick. Some people do.

BERRY Dick, their feeling, though, what they were saying in the debriefing is that they have a feeling that they would have gotten sick normally in the kind of sea that they landed in, and their feeling is that they really have been desensitized by the time they spent in the weightless state, which is an interesting kind of a comment. Now whether it's true or not remains to be seen, but that's the way they feel about it.

GORDON During Gulf egress on Apollo 9 and 12, especially 12, because I was in the center couch on 12, I'd get that Molly B for 30 seconds out there in the Gulf in those 3 foot swells, and if I stayed there for, say, 5 minutes or really started reaching around, that's as close as I come to throwing up. And I've never thrown up from motion sickness, but I've gotten to where I felt pretty bad. And especially after the point that I get bad feeling the passes. And when we get Gulf egress training, I bet I got back in that couch five times before I got the job done down in the LEB, because every time I got down there, I'd get my head down or

[redacted]

GORDON (CONT'D) something and we were bobbing around before the collar was on there, I could just see it coming if I got back in that couch, I was going to throw up. I got out there and it was three times as rough, and I was in the LEB and in the couch, up over the ceiling, we were changing the bags around, talking to all these guys out there, but I just stood down there and got the ... on, I remember all over the place and I'd never even have a flivver of feeling upset, and Dave Scott said, Dave gets very swishy on the water in the spacecraft, he said that after Apollo 9, he said, "Gee, he was down there in the LEB and up and around and he felt terrible out there in the Gulf and he never had a glimmer," and I really do think you do get used to it, or you tune it out, or the fact that zero g does something to your ears, if you adapt. Now maybe if a guy's like Rusty and he doesn't get completely adapted up there, sure, he may get sick, but I hope the guys won't have to take that motion sickness stuff.

BERRY I think that's real interesting.

GORDON A few guys ...

BERRY Yes.

GORDON ... be made sleepy.

BERRY Yes, this one doesn't.

GORDON It doesn't do it. It's got that ... and whatever else it is.

BERRY Yes. The highest indexity. Dick, as we got it from your debriefing, none of you had any sensation whatsoever in the beginning of the flight when you got out of the couches and starting moving around. Nothing at all.

GORDON Nothing. Not even ... You're talking about in flight or the Atlantic?

BERRY In flight.

GORDON Also, when we got up and got out, Pete and Al were in the couches, so we'll have ...

CONRAD Well, people have talked about, as soon as they have started to move a little bit in the Apollo spacecraft, they could notice ... I was looking for it, and I never saw a thing,

CONRAD (CONT'D) and I probably forgot it as soon as I got whistling around; the only time I was looking was when Dick and I traded places; and that was the first time I got up and started moving around.

BERRY How about you, Dick, when you had to go?

GORDON I'd been up and out of the couch and we had extra things to do; I was hurrying to get these things done and I didn't even pay any attention to what the hell it was feeling like or anything. And no sensations like you mentioned where, after we stopped doing the work was anything ... I didn't notice anything. The only sensation at all was this full-headedness we didn't foresee. ... the entire flight.

CONRAD Well, maybe the other reason, other than, as said, we adapted real well, we went out on the LM twice that day. Some things that the other guys mentioned were getting disorientation coming in and out of the different spacecrafts, and, hell, I was doing 180's in the tunnel and in and out; I never got disoriented. The only time I ever knew where I was was when I woke up, and I wouldn't really say I was ... when I woke up until I could really see. But I really think this is all an individual characteristic to begin with.

BERRY I do too.

CONRAD Now, I mentioned this to you before. I just completely put it out of my mind. I've never ever experienced motion sickness. And as much as all this talk about adaptation goes on, I'm just speaking for myself, I never really felt that I was ever going to experience it. And, as it turned out, this time I didn't; that's not saying I couldn't. But I also feel that there is a certain psychological aspect to this. I think a guy that can talk himself into being sick. I really do.

BERRY No question about it.

CONRAD And when you get out in the Gulf, well, that's really going to be bad. And I feel that, God damn, they, expect to get sick, and they just flat talk themselves into getting sick.

BERRY Question: That psychological set has a lot to do with it. And then, yes, environmental factors like some heat, smells, and things of this sort all that can add up and can really give it to you.

CONRAD It's something other than that, it never got uncomfortable in that spacecraft. In Gemini, you'd just feel it heating up in there. You'd get heat soak-back, but I was never aware of any heat soak-back in Apollo. Maybe it was cause we went stable II and cooled her down from all over, but I had a feeling we didn't even have to open up the PLV.

GORDON I did, too. We didn't need that at all, in face we closed it. There was water coming in through the fan, and it was spraying water on us occasionally, so hell, I just closed the damn thing, and it was perfectly comfortable in that spacecraft. Maybe it was because - maybe not wearing the suits, you know, we were dressed fairly lightly and we took off the outer garments right away anyway, getting ready for the blue flight suits that were coming in. So we were down just in the constant wear garments for quite a bit of time.

BERRY That's very good. Let me ask you about this look that you had, this fullness and this feeling that - it was the feeling and then the looking that your face was full, too. How long - did you notice at all after you got back - when you got back into the one-g environment, did - was - did it disappear right away as far as you knew.

SPEAKER ...

BERRY You probably didn't notice it.

GORDON You mean appearance, I never -

BERRY Right, appearance.

GORDON - had the feeling of being full in the head until after 24 hours.

BERRY Right.

GORDON The next morning it was gone, and I never felt like it any more than that.

BERRY But the look - the look of the fullness.

GORDON I guess I exhibited this more than Al. I didn't particularly notice this change, and if you asked me to look at him and say, yes, his face is a little fuller than it was ..., I guess I could say that.

CONRAD There was another thing that enhanced the appearance on Dick, and that was the fact that his hair wasn't combed most of the time, and he was the only one with long hair in there, and that's the way it sticks out in every direction, up there too. So he looked a little different all the time.

BERRY Yes. How about in 1/6-g Pete. Did you notice anything? Did he get back to more normal appearance, when you saw him in the LM?

CONRAD I don't remember noticing anything in particular. The thing I noticed more than anything else was, because he didn't have his suit on, the funny way your shoulders droop all the time. They're like that naturally, after awhile you start relaxing up there, and you don't - you - sometimes you have tendencies to just be the way you should be in one-g, you know and you sort of have to say well, relax, you know, and you let go.

BERRY Yes, that is a very interesting comment. I think every time we get to talk to anybody who's been there for that period of time -

CONRAD I mean it - you can take an honest - a 70-millimeter shot in there - you see with that bug-eyed lens, every time you look at movies with the sixteen up there, they're distorted to start with, and I suspect if they had some high-speed ... 70 millimeter and we got some really good stills in there, you might ask Jim or those guys once, sometime if they could get a good still shot in there of a guy stripped from the waist up, and just completely relaxed in there in the LEB, and you got a photograph of them, you'd see it just like that with an 80-millimeter lens, now with that bug-eye lens has got ...

BERRY That might be a good thing to get them to do, to take a - pick one or maybe you can do it on all of them, just get a good facial shot of them, prelaunch two, that they could get, and then have them take a shot of each other after they were up there, within the first day or two on the way out.

[redacted]

CONRAD Well, I think it's logical. It's just - it's got to be somewhere in the same phonemena as the conditioned reflex for your blood vessels to squeeze down anything when you stand up. I'm not at all sure that there isn't something in the fact that things here - maybe you don't have the muscles that can - may not take - you know the fullness in your head - it either goes away or you ignore it, one of the two. You know, it may be that you don't just squeeze back down up in these blood vessels or something for a long period of time. I don't know.

BERRY Well, I think - there is no question, you are getting some redistribution of fluids in the body because what happens is the blood column doesn't weigh anything, and so it redistributes itself instead of having the bulk of the blood volume below the heart level here, if you look at the distribution in the body. Now you get an increase in the part that's above the heart, and so that's what you see. Now, the heart senses that and in what we call the Henry-Gauer reflex, what happens is that as you fill - get an increased blood supply coming back into the heart, it dialates that area and it sets off a reflex that causes the kidney to put out more fluid, and that's why we are trying to find out, were you aware of that. You know that's one of the ways the body tends to adjust physiologically. It says, "Hell, I've got too much fluid," you know, so it tries to get rid of some of it.

BEAN I think after it's taken in to the amount of weight that I lost this time, I feel that I ate equal to my normal food on the ground, because I ate everything in sight in the spacecraft, within ... but I ate just about everything, and mostly what I didn't eat were the juices and a couple of desserts I didn't care for. But I only lost 2 pounds, and I suspect that that was all back the next day, and I'm sure that was only fluid. I think that I kept everything else normal and that 2 pounds was probably the normal adjustment of protoplasm.

BERRY That's right.

CONRAD What's two pounds worth in pints? Half a pint?

BERRY About a pint to the pound.

CONRAD That's 2 pints.

SPEAKER Yes. That's about right.

BEAN It's real hard to correlate the intake versus output..

BERRY Yes.

BEAN You just normally eat - I'm sure that we were just as ready on the water faucet as anybody, if probably not more so. In fact the FIDO's are all mad at us over there for pissing away our state vector all the time.

BERRY Yes, I know.

BEAN ... dumping urine. Every time we turned around, somebody had that urine being dumped.

BERRY Yes. All right. Okay, I think we ought to tell you about that radiation thing. You mentioned something about you saw a 300 jump on - or 30, you said 30 millirads. It was really - there was a 300 - you picked up 300 millirads coming in through the belts at reentry.

CONRAD Did we get the same going out?

BERRY No, you came at a different trajectory. You spent more time - you spent more time in the belt on the way back. And so what happened, your total radiation dose goes up. To that point it had only been about 250 millirads. You got more coming through the belt then you did the whole rest of the mission.

BEAN Did you - had this been predicted, sir?

SPEAKER No, that came as quite a surprise. We thought something was wrong with our -

CONRAD I read my meter first and I thought, gee, it must have banged on the couch when we hit the water and it jumped or something, and then we got to looking at it and all three of us had gone up equally the same amount so we decided that had to be radiation and not banging around -

BEAN We took those things in the MQF and banged them on the table trying to get them to jump. They won't jump.

[redacted]

BERRY Yes. Well, the thing they did is, see they can't really tell you exactly what's going to happen for a prediction until they - until you've done your last midcourse there on the way back, and as soon as they've done that. Well, then we put that stuff into the computer over there and they can give a pretty good prediction. It came out almost exactly what was predicted, that you got, and it's still zilch, you know you got -

SPEAKER Based on a 6-degree entry or something like that.

BERRY Yes. You end up with - you got about six-tenths of a rad so you know that's still no problem at all.

GORDON What's an x-ray worth, chest x-ray.

BERRY It's about 40 - 45 millirads. You got about six chest x-rays, right.

GORDON That's good for the next 6 years then, right?

BERRY Yes, no more - (laughter) I don't know, you ought to have a chest x-ray every month after all that dust you guys have been inhaling (laughter) We may find something now, you say it's not from the cigarettes, it's from that lunar dust, kids.

CONRAD Have you looked at our shipboard chest x-rays in seriousness to see if there was anything like that in there?

BERRY No, I haven't but Clarence asked that - ve want to take some good - look carefully at them from the other films, too.

BERRY Thank you all very much.

SPEAKER This is the end of tape 3.

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