



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS 77058

REPLY TO
ATTN OF: DA

August 9, 1971

MEMORANDUM

TO: Record

FROM: DA/Director of Medical Research and Operations

SUBJECT: Apollo 15 Debriefing

The following notes represent a partial debriefing conducted with the Apollo 15 crew on the morning of Monday, August 9, prior to the R+1 physical examinations.

1. The arrhythmias noted in flight were discussed with the crew, in detail with Jim Irwin and with Dave Scott. Jim did have a sensation of utter fatigue which occurred at the time of the bigeminal rhythm. He remembers this very well because it seemed inappropriate in the light of the hatch and suit problems they had encountered previously. He was not aware of any feeling of his heart turning over due to increased filling. He was aware of tachycardia on several occasions, in particular at the end of the last EVA. Dave was at no time aware of any cardiac irregularity and had no symptoms.
2. EVA Activity: Both Dave and Jim admit that there was a great deal of work involved in the EVA activity and that they did get fatigued. Jim in particular was aware of the high work load and high heart rates on trying to get into the LM at the end of the first EVA. This was a difficult task due to the only partial opening of the hatch. Dave estimates that he was pressing about 400 lbs. worth trying to remove the drill. He feels that this was his heaviest work load. Preparing for the EVA and the difficulty in removing about in the cramped LM was some of the most difficult part of the activity and they were relieved to be outside where they could stretch. The falls sustained were easily handled and Dave compares it to bouncing on a trampoline and says that it is very easy to get up. Jim was concerned about Dave's fall in the rock field when he stumbled over the rock down near the rille.
3. CDR Finger Nails: Dave has hemorrhages under the finger nails particularly of his right hand which were sustained due to the tight

fitting of the gloves of the suit while working on the first EVA. This became so painful that he was not sure how he would do on the second day. These are obvious hemorrhages on examination which would have been greatly relieved by drilling the nail and relieving the pressure. He feels that some compromise must be made between a suit fit with the arm outstretched and with the arm in a working position near the body and chest. He elected 3 days prior to flight to accept the tight fit with the hands and arms in the working position.

4. Tunnel Pressure and Suit Problem: The crew were unable to explain the increase in pressure in the tunnel prior to LM-jet and said that their inspection of the hatch seals revealed no foreign material but it could have blown off in opening the hatches. They are still unable to explain this event but felt as we did that it was necessary to go very slowly and do the proper things. They were very tired and realized that we were tired on the ground. The suit problem prior to the tunnel episode involved the changing only of Dave's LCG plug. He states that the lock-lock was on on the LCG fitting when Jim checked it inside Dave's suit and in spite of that they replaced the plug instead of the fitting. Then on a pressure check, the ground said it was good while it did not register as being acceptable in the spacecraft. They then found a glove was loose on one of the crewmen and this probably was the cause of the entire episode requiring several suit checks.

5. Food and Water: The crew ate everything that was available including food bars on EVA's 1 and 2. The only thing they did not eat of their food available to them in the spacecraft were some bacon squares. They feel that they drank well with the exception that Jim's in-suit bad did not work and he got no liquid during EVA activity and Dave's worked for only the first EVA when he drank about half of the 32 oz. available. On the second and third, he had the nozzle slip loose and he was unable to reach it.

6. Diet: Dave frequently commented on the dirt and feels that this may have been one of the factors in the suit difficulty encountered. The dirt got on everything and they had a severe problem with it in the LM. They also found that it took two days of fan operation in the command module to clear the lunar dust from the air.

7. Vestibular: Dave states that he was quite surprised that he had no abnormal vestibular responses on this flight as he had on Apollo 9. He moved carefully during the initial hours of weightlessness and was trying to advise everyone else to do the same when he became aware of the fact that he was moving his head quite freely without symptoms and this did surprise him. Al Worden had no symptoms at any time.

Jim Irwin felt that he never did adapt to the zero g environment prior to lunar decent. This lack of adaptation was evident in a feeling of fullness in the head which persisted for this entire period and a feeling of nausea noted on any rapid head motion. On his return to the command module after the lunar surface activity, he noted none of these symptoms.

8. Al Worden stated that he stopped using the exercise device and put it away. He was exercising by doing a bicycling motion with his legs and we had monitored one of these exercise periods in which he reached a heart rate of 128. He felt that this was a very effective method of exercise and would have given anything to have the ergometer. He felt that it was a great help and should be mandatory on future missions for crewmen to be told what their heartrates are during the time of exercise so that they can achieve a satisfactory heartrate level. The crewmen always felt that they did have adequate sleep and seemed very interested in our observation of their sleep cycles as evidenced by the ECG. We have agreed to discuss our findings with them prior to the press conference on Thursday in case there are questions asked. Dave and I both feel that we must be honest should they be asked a direct question and enough people know about the arrhythmias at the present time to make it a likely possibility that a direct question could be asked.

9. Our inability to get agreement with Deke on a firm postflight partial isolation plan was discussed with Dave. He is concerned about their exposure as I am and asked that we check them each a.m. We will do this.

Charles A. Berry, M.D.