

ARMSTRONG HG, HABER H, STRUGHOLD H. *Aeromedical problems of space travel*. *J Aviat Med* 1949; 20: 383-417.

Commentary by MARK R. CAMPBELL, M.D.

This appears to be the first journal article ever published concerning space medicine. It presents the content of a conference convened by General Harry G. Armstrong on November 12, 1948, at Randolph Air Force Base in San Antonio, TX. The topic was "interplanetary travel" with the focus on a voyage to Mars that was expected to take 5–10 weeks each way. The origin of this interest in space conditions was a literature search performed 6 months previously by Drs. Heinz Haber and Hubertus Strughold at the request of Gen. Armstrong on medical issues associated with travel in the upper atmosphere.

The first half of the paper consists of the formal presentations. Dr. Haber outlined the physics of spaceflight and discussed many factors that are still of critical importance, although he discounted the possible health effects of ionizing radiation from the sun, which is now recognized as a potentially serious health threat on long-duration spaceflights. Other issues that were discussed include propulsion, orbital dynamics, navigation, attitude control, thermal control, meteor collisions, mission duration, conditions on other planets, launch acceleration forces, the absence of gravity on orbit, and the concept of artificial gravity. Dr. Strughold discussed several medical issues, including cosmic radiation, launch acceleration forces, tolerance to weightlessness, artificial gravity, cabin atmosphere composition and life support, cabin decompression risk, reaction times relative to the extreme speed of the spacecraft, psychological problems of isolation and stress,

planetary atmospheres and conditions, and ultraviolet radiation risk to the eyes. He also pointed out the increased fire risk of a cabin atmosphere with a high-O₂ composition. Dr. Strughold chose to discuss three topics more in depth: the requirements for ambient gas composition and pressure in a space capsule, the physiological effects of the absence of gravity, and the problems due to the slowness of human reaction times relative to the speed of spacecraft and other objects in space. The first problem has now been solved, the second is very much with us, and the third has been rendered irrelevant by the use of computer systems.

The second half of the article consists of a transcript of the ensuing discussion and reveals the early concerns of a number of luminaries in the world of aerospace medicine. Cosmic radiation was viewed as a greater concern than Dr. Haber had proposed and a suggestion was made to use underwater neutral buoyancy as a method to simulate zero-G conditions.

Shortly after the conference, on February 9, 1949, Gen. Armstrong established a Department of Space Medicine as part of the School of Aviation Medicine at Randolph with Dr. Strughold as its director. Additional conferences on space medicine were subsequently held in March 1950 and November 1951.

Classics in Space Medicine are selected from among more than 250 space medicine articles published prior to 1965 in this journal under its previous title, *Journal of Aviation Medicine*. The series is edited by Mark R. Campbell, M.D.

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