

**NOVEMBER 1995**

*New astronaut training technique (Duke University, Durham, NC):* "Zero gravity conditions for astronaut training have traditionally used neutral buoyancy tanks, and with such tanks hypogravity conditions are produced by the use of supplemental weights. This technique does not allow for the influence of water viscosity on any reduced gravity exercise regime. With a water-foam fluid produced by using a microbubble air flow together with surface active agents to prevent bubble agglomeration, it has been found possible to simulate a range of gravity conditions without the need for supplemental weights and additionally with a substantial reduction in the resulting fluid viscosity. This new technique appears to have application in improving the simulation environment for astronaut training under the reduced gravity conditions to be found on the moon or on Mars, and may have terrestrial applications in patient rehabilitation and exercise as well."<sup>3</sup>

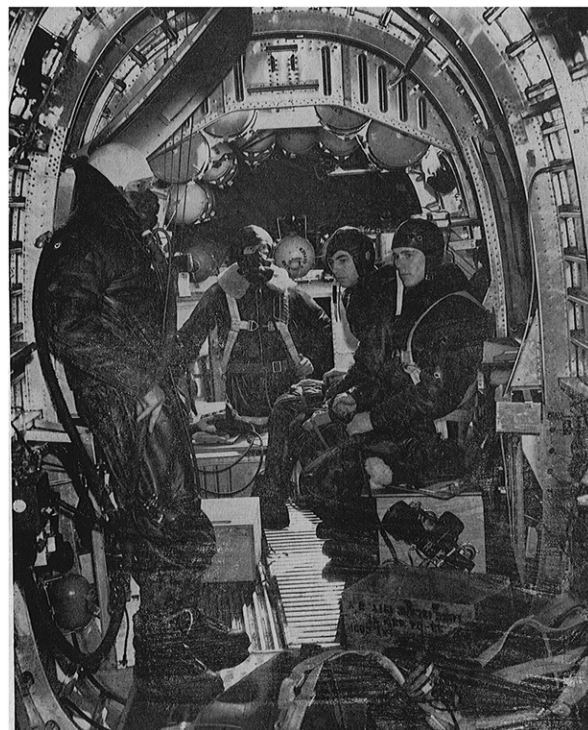
**NOVEMBER 1970**

*Wanna bet divers are different from pilots? (Navy Experimental Diving Unit, Washington, DC):* "Twenty professional U.S. Navy divers and a comparable control group of nondiving enlisted men were given the Minnesota Multiphasic Personality Inventory (MMPI) and the Edwards Personal Preference Schedule (EPPS) [and]... both groups selected bets from among a series of hypothetical gambles in order to study differences in attitudes toward risk. The results showed that divers (a) scored essentially the same as the control group on the MMPI, (b) scored significantly higher than control subjects on the aggression and change scales, and significantly lower on the affiliation, nurturance, and intraception scales of the EPPS, and (c) consistently selected from bets in which the probability of winning or losing was the same (.50) [as] those bets in which the greater amount of money was involved. A comparison of these results with studies of parachutists and jet pilots indicated that divers were similar to parachutists in betting preferences, but showed personality characteristics which were significantly different from both parachutists and jet pilots."<sup>1</sup>

**NOVEMBER 1945**

*Avoiding decompression sickness at altitude (University of California and Consolidated Vultee Aircraft Corp., Berkeley and Los Angeles, CA):* "The serious and incapacitating nature of [decompression sickness] has limited the altitude of operation for both pilot and crew member and has been a factor leading to the development of the pressurized cabin airplane. Most combat flying, however, continues to be carried out in nonpressure cabin aircraft often at altitudes where 'bends' are encountered. Although in the past few years numerous studies on decompression sickness have been carried out in various altitude chambers, there has been need of a parallel systematic investigation of this problem in actual flight... [W]e wanted to find out whether it might be possible for relatively large numbers of men to fly, work, and fight for long periods at 35,000 feet in nonpressure cabin aircraft..."

"A detailed comparative study of bends in a series of 25 airplane flights at 35,000 feet and in extensive low-pressure chamber



**Fig. 1.** Two observers (right), one of whom was a physician, and subjects (left) seated in the waist gunner's compartment. Note the small platform for step-up exercise. [Ed. note: This was Fig. 2 in the original article.]

simulated flights is reported [Fig. 1]. Decompression sickness, as observed under both conditions, is quite similar in degree, nature, and incidence... Experience gained in a study of 167 man-flights at 35,000 feet shows that although it is possible for men to fly and work at this altitude in nonpressure cabin planes, pre-selection and pre-oxygenation are necessary and even then occasional severe reactions are to be expected."<sup>2</sup>

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This column is prepared each month by Walter Dalitsch III, M.D., M.P.H. Most of the articles mentioned here were printed over the years in the official journal of the Aerospace Medical Association. These and other articles are available for download from Mira LibrarySmart via <https://submissions.mirasmar.com/asmaarchive/Login.aspx>.

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