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JULY 1996

Medicine of Biosphere (UCLA School of Medicine, Los Angeles, CA; University of Arizona Health Sciences Center, Tucson, AZ; Space Biospheres Ventures, Oracle, AZ; Paragon Development Corp., Tucson, AZ): “Biosphere 2 is a 3.15-acre, 7-million ft. 3 enclosed ecological space near Tucson, AZ. It contains five wilderness and two domestic biomes (rain forest, savanna, desert, ocean, marsh; agricultural station, living quarters), an original introduction of 3,800 species (~20% extinctions have occurred), and a large basement ‘technosphere.’ Sealed inside Biosphere 2 in September 1991, four women and four men, including two of the authors, maintained themselves and the various systems for 2 yr, the longest-sustained ‘isolated confined environment’ period on record. MMPI psychological profile scores for Biosphere 2 crewmembers correlated closely with those reported for astronauts and shuttle applicants. Major medical problems encountered during the 2 yr included adaptation to a low-calorie (1800–2200 kcal·d⁻¹ per person) but otherwise nutritionally adequate diet, with substantial weight loss (18% for men, 10% for women), and a declining oxygen atmosphere (down to 14.2%).”³

JULY 1971

Regulations of aeromedical transport (FAA Civil Aeromedical Institute, Oklahoma City, OK, and Clearwater, FL): “Fixed-wing secondary ambulance service is growing at a rapid rate without the benefit of studies such as those pertaining to helicopter primary ambulance service. Problems associated with this growth relate to equipment, crew training, and knowledge of the physiology of flight...”

“Recent changes in Federal Aviation Regulations, Part 135, provide much higher operational standards for the air-taxi operation than previously existed. These changes affect any air-ambulance operator, but at present there are no regulations which mention the specialty of air-ambulance operation.

“Efforts are necessary... to bring the care of the patient being transported by air to the same level provided by surface transportation in those states and cities with regulations. The fact that a patient is being transported does not alter his patient status.”²

Communication with ear plugs (Naval Aerospace Medical Research Laboratory, Pensacola, FL): “Direct person-to-person speech communication is sometimes required in rotary-wing aircraft where high levels of noise make the use of hearing protective devices desirable... Intelligibility test data obtained in flight as well as in a simulated flight situation indicate that the use of earplugs in rotary-wing aircraft will improve the reception of direct person-to-person speech communication. Moreover, their use will afford protection against the deafening, fatigue, and annoyance effects of the hazardous noise present in rotary-wing aircraft.”⁴

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JULY 1946

Easy hypoxia demo (Aero Medical Laboratory, Wright Field, Dayton, OH): “Studies by various investigators have shown that certain visual functions, notably dark adaptation and contrast sensitivity,

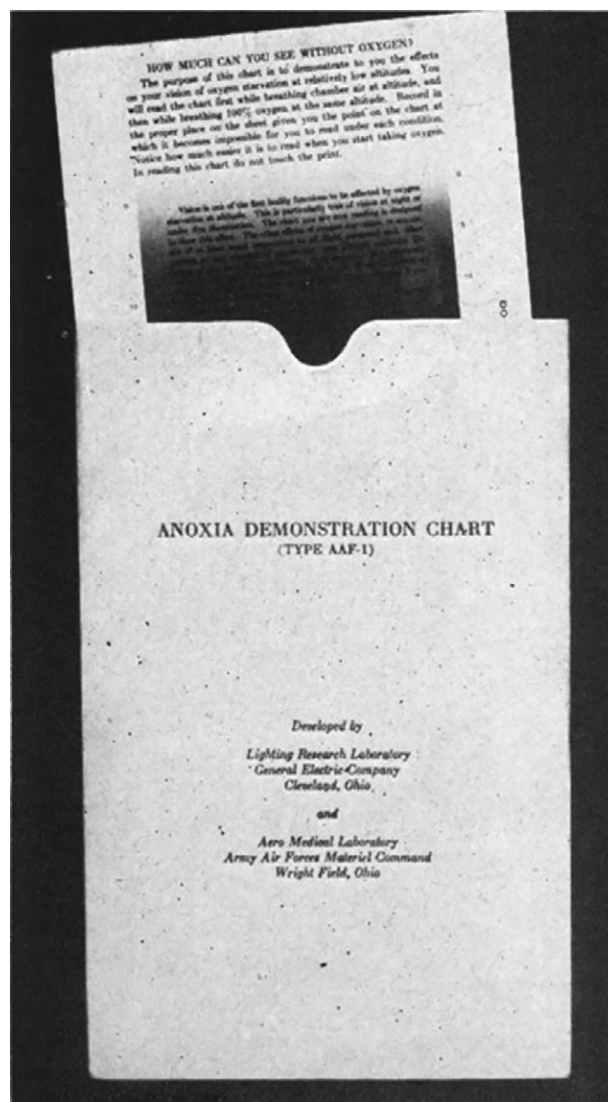


Fig. 1. The Luckiesh-Moss-Army Air Forces Anoxia Demonstration Chart, Type AAF-1. This is merely an illustration. The original has a carefully prepared and much smoother contrast gradient.

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are among the first to manifest appreciable impairment due to anoxia...

"The Luckiesh-Moss-Army Air Forces Anoxia Demonstration Charts [Fig. 1] were devised for demonstrating the effects of anoxia on contrast sensitivity. Results on over 1,000 subjects show that a demonstration with these charts convinces over 90 per cent of indoctrinees at simulated altitudes of 15,000 and 16,000 feet. The demonstration is easy to explain and administer, requires little in the way of apparatus and props, and can easily be completed in fifteen minutes. A survey of AAF Altitude Training Units shows that the demonstration can be successfully integrated into routine high altitude indoctrination flights."¹

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