

**FEBRUARY 1994**

*Measuring and categorizing spatial disorientation (Armstrong Laboratory, Brooks AFB, TX; Air Force Safety Agency, Norton AFB, CA):* "Spatial disorientation (SD) continues to contribute to a fairly constant proportion of military aircraft accidents. The U.S. Air Force (USAF) fielded a new accident investigation reporting form in July 1989, which for the first time specified Type I SD, Type II SD, and Type III SD as possible causes of aircraft accidents. Of a total of 91 major accidents that occurred over the 2-year period beginning in October 1989, SD was rated as contributing significantly to 13 (14%). Coding for SD on accident investigation reporting forms was not consistent, however. Individual flight surgeons differed in their approaches to coding accidents as SD-related; other differences were noted between flight surgeons and pilots, and additional procedural differences resulted in inconsistent reporting over time. There is a consensus that SD represents a major problem in military aviation, but a scientific approach to this important problem would be facilitated if agreement could be reached on definitional and semantic issues."<sup>3</sup>

**FEBRUARY 1969**

*Hypoxia warning device (Aerospace Medical Research Laboratories, Wright-Patterson AFB, OH):* "A technique providing accurate, reliable and operationally realistic hypoxia warning is evaluated. It incorporates a dry electrolyte oxygen sensor with millisecond response time and an alarm circuit designed to recognize and count breaths exhibiting maximal pO<sub>2</sub> values below an electronically pre-set pO<sub>2</sub> warning level. Thirteen men, breathing ambient altitude chamber atmosphere 'rode' from ground level to 9500 feet and return (1500 ft/min) simulating operational malfunction in oxygen delivery. The system continuously sampled gas mixtures within the mask. The system was pre-set to initiate a hypoxia warning alarm at 118 mm. Hg pO<sub>2</sub>. For all subjects, the mean value for alarm trigger (78 observations) was 118.61 mm. Hg pO<sub>2</sub> (standard deviation = 3.121 mm. Hg pO<sub>2</sub>). For resetting the alarm to its 'safe' status (77 observations), the mean value was 120.78 mm. Hg pO<sub>2</sub> (standard deviation = 3.179 mm. Hg pO<sub>2</sub>)."<sup>2</sup>

*Adaptation to motion (Naval Aerospace Medical Institute):* "In the present experiment overt symptoms of motion sickness at 10 rpm were prevented solely by means of incremental increases to terminal velocity. This demonstrated that the adaptive processes somehow inhibited the irradiation of vestibular activity to cell assemblies in cerebellar, hypothalamic, and other areas concerned in the genesis of symptoms and that 'habituation of symptoms' was not essential in their prevention. By ensuring man's stability, these processes properly may be regarded as homeostatic in nature, preserving a homeostatic state. This implies that [slow rotation room] sickness may be defined as a failure in homeostatic processes caused by too sudden an exposure to strong Coriolis acceleration which somehow permitted irradiation of vestibular activity to areas either not normally stimulated or stimulated below the level of subjective awareness. The symptoms of such sickness represent absurd responses in terms of man's welfare leading to instability. The underlying processes therefore are

clearly nonhomeostatic in nature, producing a nonhomeostatic state."<sup>5</sup>

**FEBRUARY 1944**

*The misnomer of aeroneurosis (Major, Army Air Corps):* "Aeroneurosis denotes the presence of a psychoneurosis in a flyer. There are several objections to the use of this term. First, there is not always a clear etiologic relationship between flying and the development of the neurosis. Secondly, there is no evidence of a special or unusual neurosis peculiar to flying personnel. Thirdly, the pathogenesis, symptomatology and therapy are no different from the ordinary psychoneurosis seen in clinical practice. The term serves no useful purpose except to indicate the occupation of the patient, and should be eliminated forthwith from medical nosology..."

"The following terms refer to various predisposing factors, i.e., *fatigue neurosis*, *congenital asthenia*, *neurosis of pregnancy*, *soldier's heart*, *aeroneurosis exhaustion neurosis*. The precipitating event is described by the terms *shellshock*, *traumatic neurosis* whereas somatic localization is recognized in *cardiac neurosis*, *gastric neurosis*, *railway spine*."<sup>1</sup>

*Testing medical equipment for flight (Army Air Forces Materiel Command, Engineering Division, Chief, Aero Medical Laboratory, Wright Field, Dayton, OH):* "The flight surgeon, according to General H. H. Arnold, should be interested in all phases of a pilot's work and it is mandatory that every flight surgeon fly with his personnel..."

"In high altitude flying, not only must the performance of the airplane and its engines be considered, but also the performance of all equipment. This equipment includes oxygen apparatus, pressure suits, supercharged cabins, heating, defrosting and oil lubricating systems, ignition, electrical systems and armament.

"The function of items of medical equipment... should be checked carefully in each new type of airplane as its construction, general arrangement and performance may be appreciably different from those of other airplanes already in use."<sup>4</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.mirasmart.com/asmaarchive/Login.aspx>.

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DOI: <https://doi.org/10.3357/AMHP.5305.2019>