

THIS MONTH IN AEROSPACE MEDICINE HISTORY

Seventy-Five Years Ago in March 1939

Duties and responsibilities of the flight surgeon (Medical Director, Medical Department of Eastern Air Lines, Inc., Coral Gables, FL): "Any influence, inadvertently or otherwise, which discourages free exchange of ideas between all doctors who are consecrated to the most difficult of all specialties, aviation medicine, should be sternly discouraged. It is only by complete and free cooperation and without obstruction or competition of any kind, we may hope to fulfill the duties of our offices and to meet the stresses of an ever increasing degree of responsibility in conserving health, safeguarding lives and promoting better industrial safety.

"When it becomes necessary to disqualify a pilot, he is coincidentally deprived of ability to earn a living, perhaps in the only field from which he is capable of self-support. Flight surgeons must, therefore, weigh carefully the value of veteran piloting experience against health defects. An increasing experience indicates that in commercial flying, at least, veteran pilots have repeatedly demonstrated a fine ability on the flying side to compensate against defects on the health side. In a program of industrial medicine, and, after all, the work of an airline medical department constitutes an effort in the field of industrial medicine, the medical director must realize, emotionally, at least, that the most tender nerve in the body leads to the pocketbook.

"It is advocated, therefore, that disqualifications may be postponed, provided the pilot who is regarded as a borderline case gives the flight surgeon full cooperation and is willing to subject himself to more or less constant medical supervision. Thus the experienced flight surgeon may keep his finger on the pulse of the situation. By intimate professional contact, he will be able to recognize when the point of manifest danger has been reached.

"It is commonly expressed among the laity that patients place their lives in the hands of the doctors. We, as flight surgeons, should be willing at all times to reverse the usual order of affairs by flying with our pilots whom we certify as physically qualified for piloting duties. The flight surgeon should be willing to trust his life in the very fine and capable hands of the airline pilots, our patients" (2).

Fifty Years Ago in March 1964

Involvement of the U.S. Air Force Medical Service Corps in development of intercontinental ballistic missiles (Office of the Surgeon, Headquarters Fifteenth Air Force, March Air Force Base, CA): "Although previous intercontinental ballistic missile weapon systems posed many and varied occupational and aerospace medical support problems, it was not until the advent of the SM-68B, Titan II that large scale toxicological problems presented themselves as potential impediments to the operation of a desirable weapon system. The importance to our national security of the increased performance factors of the Titan II demanded that whatever occupational health problems presented themselves had to be dispensed with in such a way that the human element in the weapon system would not be the limiting criteria to its operational performance. The principal advantage to this missile system lies in its non-cryogenic storable propellants, aerazine-50, the fuel, a mixture of hydrazine and unsymmetrical dimethylhydrazine (UDMH), and nitrogen tetroxide as the oxidizer.

"A significant requirement for medical service participation in the development of this weapon system existed from the early design stages. Full recognition of the potential toxicological problems associated with the propellants was stressed at each and every developmental conference at which SAC medical service personnel were in attendance" (3).

Twenty-Five Years Ago in March 1989

Suggestion of underwater lighted track for emergency egress (Environmental Sciences Division of the RAF Institute of Aviation Medicine, Farnborough, Hants, UK): "The time to detect each of three underwater lights by six subjects was measured in clear and turbid (attenuation coefficient = $4.2 \cdot \text{m}^{-1}$) water, at distances of 1.54 m and 3.1 m, from two viewing angles, straight ahead (0°) or 65° to one side, and under three levels of ambient illumination. The lights were viewed either through a window, to simulate the use of a face mask, or with the subjects immersed. All lights were detected rapidly (< 1 s) when viewed through the window in clear water. In turbid conditions, none of the lights was seen at 3.1 m by any subject. At a 1.54 m viewing distance, reliable detection by immersed subjects was found only in the clear water under the two darker ambient illuminations. In turbid water, detection was unreliable. We conclude that the design of underwater escape lighting should not rely on visibility over distances greater than 1.5 m, and that an illuminated guide-bar might provide valuable assistance in directing escape from aircraft" (1).

Ground crew need hearing protection – and is the 4000 Hertz notch a misnomer? (Institute of Aviation Medicine, Air Force, People's Liberation Army of China, Beijing, People's Republic of China): "Audiograms were taken on 20 young men before and immediately after exposure to Fighter-6 [Chinese built version of Soviet MiG-19] ground running-up noise, and their course of recovery was followed. The sound levels at the engine hatch were 117-128 dB(A). The noise-induced temporary threshold shift was more than 13 dB. The maximum threshold shift occurred at 4 kHz. The shift in the low and speech frequencies recovers more rapidly and is completed in 30 min, whereas that in the high-frequency range recovers much more slowly, not returning to normal until 24 h later. High-frequency hearing loss is at risk in groundcrew. In order to prevent hearing damage, they ought to wear ear-protectors. We discovered that the V-shaped depression was not at 4 kHz but at 6 kHz. The former view concerning the pathogenesis of '4 kHz depression', therefore, is open to question. This interesting subject warrants further study" (4).

REFERENCES

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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.miraacd.com/asmaarchive/Login.aspx>.

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