

APRIL 1997

Recurrent G training (Headquarters USAF Europe; 86th Medical Group, Ramstein Air Base, Germany): "Initial high-G centrifuge training of USAF fast jet pilots was instituted in 1985... Aircraft accidents caused by an improperly performed anti-G straining maneuver (AGSM), however, continue to occur... A test program to reinforce the proper performance of the AGSM in flight was initiated in the United States Air Forces Europe (USAFE) in 1993. Head-up display videotapes (HUD tapes) were recorded during flight and critiqued during debrief by flight leads for AGSM technique and continuity... 78 surveys were completed out of 110 distributed (71%). There were 57 pilots (73%) who reported one or more problems with their AGSM: 33 noted that the timing of their breathing was too quick (<2 s cycle), 11 that their breathing was too slow (>4 s), 9 that inhalation was too long, 18 occasionally did not 'get the jump on the Gs,' and 34 frequently or occasionally talked during +G_z exposures. Of the 105 reported deficiencies, 67 (64%) were mostly or completely corrected: 30/33 (91%) if the timing of breathing was too quick, 8/11 (73%) if too slow, 5/9 (56%) if inhalation too long, 12/18 (67%) 'jump on the Gs,' and 12/34 (35%) if they talked. This program was most successful in remediating timing problems with the AGSM."³

APRIL 1972

Carrier landing skills (Naval Aerospace Medical Research Laboratory, Pensacola, FL): "[T]he only pre-RAG [Replacement Air Group, the final flight training phase] grade that shows up significantly on the night RAG carrier-qualification factor is advanced night familiarization-and that has a negative loading... The main concern regarding this factor is that the failure of aviators to successfully complete night-carrier qualification represents the primary cause of attrition at the RAG level. The cost of training an aviator up to that point is extremely high and, therefore, attrition occurring that late in training is quite expensive. The fact that the night-carrier qualification factor stands alone indicates that little is being taught earlier in training that is directly related to performance in this phase. Since this aspect of training is responsible for costly attrition, perhaps it would be beneficial to include some type of exposure to night-carrier operations prior to the RAG phase."¹

Noise and sleep (North Carolina State University, Raleigh, NC): "The present research presents data relative to the objective evaluation of the effects of a specific complex auditory stimulus presented during sleep. The auditory stimulus was a jet aircraft flyover of approximately 20-sec duration and a peak intensity level of approximately 80 db (A)... The results indicated that the physiological effects (changes in electroencephalographic activity) produced by the jet aircraft stimuli outlasted the physical presence of the auditory stimuli by a considerable degree. Further, it was possible to note both behavioral and electroencephalographic changes during waking performances subsequent to nights disturbed by the jet aircraft flyovers which were not apparent during performances subsequent to undisturbed nights. The results then suggest that even limited exposure to

nocturnal stimuli which do not necessarily produce behavioral awakening can nonetheless produce significant changes in an individual's pattern of sleeping and waking EEG and overt waking performance."²

APRIL 1947

Tests of physical fitness (Medical Field Research Laboratory, Camp Lejeune, NC): "Although many tests or measures of physical fitness have been proposed, their validation has not been an easy task owing to the difficulty in selecting an absolute criterion of validity..."

"A number of physical fitness tests – step-up, oxyhemoglobin reduction time, tilt table, Army Air Forces, dynamometer and body sway – were administered to a group of 105 hospital corpsmen and marines. All subjects were also interviewed by three medical officers who made independent estimates of their fitness. Upon completion of the fitness test administration, the men took part in a program of supervised activity. This consisted of vigorous calisthenics interspersed with brief hikes and followed by an all-night hike of 23.5 miles. Fifty-one of the 105 men participating in the fatigue test were unable to finish the 181/4-hour run.

"The step-up test, body sway, and medical officers' average rating were the only measures which yielded a significant biserial correlation with performance. Only a few of the fitness indices showed significant intercorrelation. Combining the step-up test, $r = .32$, with body sway, $r = .39$, gave a multiple correlation of .47 with performance. A multiple correlation of .51 was obtained by combining the scores on the step-up test, body sway test, and medical officers' average rating, $r = .37$. A few tests – body sway, dynamometer, and oxyhemoglobin reduction time – were administered before and after the fatigue run. The fail group showed an increase in body sway, decrease in dynamometer performance and an increase in oxyhemoglobin reduction time after breath-holding. A lesser change was noted for the few men tested in the pass group."⁴

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