

OCTOBER 1996

Color vision in air traffic control (Civil Aeromedical Institute, Oklahoma City, OK): “A data base was developed involving 121 individuals with normal color vision, 31 simple and 44 extreme anomalous trichromats, and 48 dichromats; both protans and deutans were included... Simulations of the ATC color tasks concerned color coding in flight progress strips (at en route centers), aircraft lights and Aviation Signal Light indicator (in tower operations), and color weather radar (at FSS’s)... Errors were rare among normal trichromats. Mean errors were significantly higher at every level (degree) of color vision deficiency. Approximately 6% of color deficient subjects were able to perform ATC color tasks without error. The 6% were all from the simple anomalous trichromat category; all extreme anomalous trichromats and dichromats were prone to error on ATC tasks... We conclude that these findings provide support for the requirement of normal color vision in the initial medical screening of ATCS personnel.”⁵

Crew tension in space simulation (U. of California, San Francisco, and the San Francisco Dept. of Veterans Affairs Medical Center, CA): “[D]uring a 135-d Mir space station simulation study in Moscow... Contrary to expectations, there was significantly ($p < 0.05$) more total mood disturbance and tension during the first 9 wks than during the subsequent 10 wks of the simulation. Although levels of cohesion remained the same over time, cohesion scores dropped at a significantly greater rate during the last third of the seclusion. There was evidence for the displacement of tension and dysphoria to the outside monitoring personnel. There were significant correlations in the predicted direction between leader support and control and crew cohesion, as well as evidence of status leveling in the mission commander... Crewmember tension, cohesion, and leadership are important issues affecting people working in secluded environments, and they need to be studied further in space.”⁴

OCTOBER 1971

Flight training sustainment (Harvard University, Boston, MA): “In a previous analysis very close associations were found between the proportion of pilots participating in flight training and aircraft accident rates in general aviation. This study used the techniques of the first analysis to determine the validity of these associations in subsequent years...”

“As before, increases in the proportion of pilots recently or currently engaged in flight training were associated with a decrease in the fatal general aviation accident rate...”

“The results of this study do not confirm a *causal* relation. They do support the hypothesis that measures which increase the proportion of pilots engaged in training will be associated with a *substantial* reduction in the fatal accident rate.”²

Stress of the aviation environment (Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH): “Flight in aircraft and space vehicles often exposes crew members simultaneously to several environmental stresses... To better understand combined-stress effects, ten men were exposed to heat (120°F), noise (105 dB), and vibration (5 Hz, 0.30 peak g) both singly and in combination. Measurements were made of tracking ability, reaction time, mental arithmetic, visual acuity, voice communication, body temperature, heart rate, weight loss, and subjective ratings of the stress. On none of the measures were the effects of the combined-stress condition more marked than the effect from the single greatest stressor. There was some evidence that the combined-stress condition was actually less disturbing to the subjects and their performance than was vibration alone.”³

OCTOBER 1946

Benefits of centrifuge training (U. of Southern California, Los Angeles, CA; Medical Research Division of Training, NAS, San Diego, CA): “Human centrifuges have been employed for some time for studying the physiological effects of positive radial (centrifugal) acceleration (‘G’) in producing ‘blackout’ (Amaurosis fugax) in pilots... As a result, antiblackout equipment was developed by workers in various allied laboratories, and self-protective maneuvers were worked out which combatted the displacement of blood caused by great accelerations...”

“A group of thirty-two navy fighter pilots of Fighting Squadron 66, the majority of whom were combat experienced, was organized to fly the FR-1 ‘Fireball’ semi-jet fighter plane. It was anticipated that this plane would be more maneuverable, faster, and capable of sustaining higher accelerations than previous navy fighter planes, and therefore that ‘G’ might be more of a problem...”

“Pilots wearing the suit report that they are not straining as much as without the suit, and that they are able to fly two to three times as much in combat tactics and gunnery practice as formerly because of the

anti-fatigue benefits of the suit. For this reason, centrifuge indoctrination and training would seem to be important, in order to assure that each pilot has a normal G tolerance and that he receives an adequate protection from antiblackout suits.”¹

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