NOVEMBER 1994

Aviator contact lenses (USAF School of Aerospace Medicine and Armstrong Laboratories, Brooks Air Force Base, TX): "We reviewed the USAF Tactical Air Command's (TAC) contact lens database for the period July 1989 through June 1991. An anonymous survey was mailed… to assess [aircrew] experiences using extended wear soft contact lenses (EWSCL). Analysis was performed on those responses to compare differences between aviators who currently wear (CW), those who discontinued wear (DEW), and flyers who wore EWSCL while deployed to S.W. Asia for Desert Shield/Desert Storm. Of the 396 surveyed, 284 (72%) returned the survey and demonstrated that the daily use of EWSCL to be logistically practical and physiologically safe… Subjectively, aircrews expressed strong beliefs that EWSCL contributed to their abilities as combat aviators."[5]

Prior crash as a predictor (The Johns Hopkins University, Baltimore, MD): "With a case-control design, this study examined the relationships of crash/incident history, violation history, pilot age, flight experience, and recent flight time with the likelihood of being involved in commuter aircraft and air taxi crashes… Different data bases within the FAA's airmen information system were linked to ascertain information about crash/incident and violation records in the previous 3 years, age, total flight time, and flight time in the prior 6 months… Cases had significantly higher prevalence rates of prior crash/incident and violation records. The estimated odds ratio of being involved in a commuter aircraft or an air taxi crash was 1.7 (95% confidence interval [CI], 1.3-2.4) for crash/incident history, and 1.6 (95% CI, 1.1-2.2) for violation history. A 'dose-response effect' was found with bath crash/incident history and violation history, with higher odds ratios for pilots with crashes versus incidents or with more serious violations."[4]

NOVEMBER 1969

Space radiation biology (USSR Academy of Sciences, Moscow, Russia): "The *Zond-5* biological experiments took place in an Earth-Moon-Earth trajectory. The following biological specimens were aboard the space station: turtles, Drosophila, fly larvae, seeds of the higher plants (wheat, barley, pine, etc.), various strains of Chlorella, lysogenie bacteria, etc. For an evaluation of the possible deviations that might occur during the mission, physiological, morphological, cytological, genetic, and other research techniques were employed. The total absorbed dose of cosmic radiation as recorded with the aid of various types of dosimeters situated adjacent to the biocontainers, amounted to approximately 3.5 rads."[1]

Apollo fire hazards (NASA Manned Spacecraft Center, Houston, TX): "To the best of present knowledge and ability, the fire hazard within the Apollo spacecraft has been eliminated. Full-scale boilerplate tests have shown that in both pad and flight atmospheres, fires purposely ignited can be controlled and will not propagate throughout the spacecraft. The results of this effort in military and commercial aviation and in other industrial and medical fire-safety programs will be realized in years to come."[3]

NOVEMBER 1944

Pressurized cabins (Materiel Command, Army Air Forces, Wright Field, OH): "Solution of the engine problem came with the supercharger. This mechanism pumps and compresses the thin upper air so that an engine obtains enough oxygen for proper combustion. But there remained the matter of the human reaction to altitudes above six miles up where air pressure is only one-fourth as much as at sea level…

"A sphere offered the ideal pressurization shape, but they couldn't put wings and an engine on a sphere and fly it, so Materiel Command experts began experimenting with cylindrical shapes and in 1936 came out with the XC-32, a Lockheed transport and the first successfully pressurized air frame…

"The pressurized cabin of the B-29 [first flight September 1942; introduced May 1944] has a pressure differential of 6.55 pounds. This means that when the plane is at 30,000 feet the interior pressure is equal to 8,000 feet; that at 35,000 feet the interior pressure is at 10,200 feet.

"How high an airplane may fly is limited by body strength. By boosting the pressure differential to 7.5 pounds and using oxygen, a human may fly for long periods at 40,000 feet or slightly higher, present experimentation indicates."[6]

Impact of impact (AAF School of Aviation Medicine, Randolph Field, TX): "Personnel who have been subjected in aircraft accidents to large forces for brief times may be divided into four groups. The first group survive severe impacts without important clinical injuries. At this same level of impact there is a second group with serious or fatal injuries caused by local contacts between the body and aircraft structure. At a higher level of impact there is a third group with serious, if not eventually fatal, internal and external injuries. At the highest level of impact there is a fourth group in which sudden death due to multiple internal and external injuries is the rule."[2]

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