

OCTOBER 2000

Laser threats (Federal Aviation Administration, Civil Aerospace Medical Institute, Oklahoma City, OK): "Laser pointers have been used by teachers and lecturers for years to highlight key areas on charts and screens during visual presentations. When used in a responsible manner, laser pointers are not considered to be hazardous. However, as the availability of such devices has increased, so have reports of their misuse. The Food and Drug Administration (FDA) issued a warning in December 1997 on the possibility of eye injury to children from handheld laser pointers. In October 1998, the American Academy of Ophthalmology upgraded an earlier caution to a warning, stating that laser pointers can be hazardous and should be kept away from children, after two reports of eye injuries involving young girls (age 11 and 13 yr). Of particular concern was the promotion of laser products as children's toys, such as those that can project cartoon figures and line drawings. Additionally, there have been reports involving the misuse of laser pointers (e.g., arrests made after police interpreted the red beam to be a laser-sighted weapon, spectators aiming laser lights at athletes during sporting events, cars illuminated on highways, and numerous incidents involving the illumination of aircraft)."¹

OCTOBER 1975

Personality in isolation (Submarine Development Group One, San Diego, CA): "The current shortage of fossil fuels has made it necessary to draw on large reserves located in environments which are difficult and dangerous to explore. Perhaps the most abundant of these reserves are those which lie beneath the oceans. The exploration and development of these suboceanic resources is heavily dependent on a technology which is still in its infancy but which a recent article declared was 'a research technology whose time had come' - Deep Submergence Vehicles or DSVs. The DSV mediates the transfer of critical sensorimotor and problem-solving skills between those who operate and observe from DSVs and the hostile ocean environment. Because DSV technology has progressed slowly over the last several decades, this performance transfer is limited, and much remains to be done to overcome performance degradations and to protect DSV personnel against the hazards of undersea exploration. Among the factors which are involved in poor performance and unsafe operating conditions are: cramped and poorly arranged spaces; poor observation and lifting facilities; limited propulsion, ballast and manipulator control; inadequate life support, especially for emergency situations; and the absence of an organized and dependable rescue capability..."

"The personality and developmental characteristics of U.S. Navy Deep Submergence Vehicle (DSV) personnel, including operators and crews, were documented and compared to the characteristics of U.S. Navy divers. The results show that DSV operators (DSV Oprs) had a significantly less asocial developmental pattern than divers, while developmental experiences of DSV crews (DSV Crs) were similar to those of divers. Personality measures (EPPS) indicate that both DSV Oprs and DSV Crs are presently more sociable as adults than divers and would probably be more effective in situations involving small group interaction. The modifications which have occurred in

the behavior of DSV Crs may be related to experience in the highly interpersonal DSV situation. The findings also show that DSV Oprs prefer to take fewer risks than divers, while the DSV Crs are more like divers in risk-taking behavior."²

OCTOBER 1950

Cosmic radiation (U.S. Naval School of Aviation Medicine, Pensacola, FL): "The fact that the intensity of cosmic radiation increases rapidly from its small value at sea level to higher altitudes raises the question of a possible hazard to health in flight at extreme altitudes. Among the abundant experimental data on cosmic radiation are only a few which can be used for an evaluation in terms of the actual biological dosage at different altitudes. This biological dosage rate increases from its sea level value of 0.1 milliroentgens per day to a maximum of 15 mr./day at 70,000 feet altitude in northern latitudes. Beyond this altitude the dosage rate decreases due to the decrease in the number of collision processes of the primaries with the air molecules.

"For a full criticism of these dosage values it has to be realized that the ionization from cosmic radiation is produced largely by particles of a higher specific ionization than x-rays and beta particles. The milliroentgen equivalent-man values therefore will be markedly higher than the equivalent physical values. Present knowledge does not yet permit one to give a reliable numerical value for this conversion factor.

"Beyond 70,000 feet altitude the situation is completely different. A new component has been discovered in these regions, the heavy nuclei rays. They have a relatively small penetrating power and do not occur therefore below 70,000 feet. They consist of atomic nuclei of higher atomic numbers which are stripped of all their orbital electrons. They carry the tremendous amount of kinetic energy of more than 2 billion electron-volts per atomic number. Their specific ionization is much higher than any other hitherto observed value. The mechanism of absorption in matter is of the same type as that of alpha particles but magnified by a factor of 1,000. Their range in living tissue reaches values of 10 centimeters in comparison of 50 microns for alpha particles. An estimation of their possible biological action indicates that they might represent a serious hazard to health."³

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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 are available for download at <https://asma.kglmeridian.com/>.

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