of excretion of S-35, the major load of detectable S-35 was cleared from the body within 5 days. The biological half-life of plasma radioactivity was about 19 hours. Approximately 85% of the urinary and 90% of the fecal radioactivity were excreted within 24 hours of the accident. This is in agreement with the classical concept that only a small portion of sulfur introduced in a non-organic form is retained by the body. The observations in this unusual case are discussed in the light of available literature on S-35. The body burden was estimated to have been 13-26 microcuries. There is ample evidence in the literature to suggest that these quantities of radioactive sulfur are unlikely to cause any radiation damage and, indeed, no adverse effects have been noted during the 3 years since exposure. There are 30 references. -- Public Health Eng. Absts.

497 The Radiation Field Inside Space Vehicles. H.J. Schaefer. Aerospace Med. 35, 104-110 (Feb. 1964).

The dosage distribution within a closed vessel in proton radiation fields in space is highly structured because the spatial distribution of shielding material about a point in the vessel varies with location. In addition to vehicle frame and equipment, the body of the astronaut itself is part of the total shielding matter. The question arises as to what degree stationary radiation sensors measuring the distribution of air dose in the ship would allow inferences on the tissue dose in the astronaut's body. For three typical space radiation proton spectra, the distribution of air dose is analyzed computationally for a spherical shell of uniform wall thickness and for a conical vehicle carrying a heavy heat shield at the base. The results indicate that, even for the completely symmetrical spherical vessel, the air dose varies considerably at different radial locations due to the influence of shield geometry. For the ordinary cosmic ray beam, the local air dose is higher in regions where the effective shielding is heavier, contrary to flare produced and Van Allen Belt protons which show no build-up phenomenon. For the conical vehicle, the computational analysis is extended to the dosage distribution within a spherical tissue phantom of 30 cm. diameter assumed in two locations, in the nose tip and close to the heat-shield. The results show that the depth dose distribution in the phantom differs greatly with regard to absolute level as well as to radial symmetry at the two locations. The corresponding air doses do not furnish any clues as to these differences. Specifically, greatly different tissue doses in the phantom can be found at locations at which the same air dose is measured. It is concluded that accurate determination of the radiation exposure of the astronaut requires radiation monitors to be worn on the body. This seems all the more a logical solution since personal monitoring would be needed anyhow as soon as the astronaut wants to leave the vehicle. Additional stationary sensors in the vehicle still seem useful for larger vehicles since they would indicate the directionality of the radiation and facilitate corrective action by attitude control or other means. There are 7 references. -- Author's summary

ENVIRONMENTAL MEASUREMENTS

498 Nature of Lead in Automobile Exhaust Gas. D.A. Hirschler and L.F. Gilbert. Arch. Environmental Health 8, 297-313 (Feb. 1964).

Only part of the lead which is contained in the gasoline burned by cars is discharged in the exhaust gas. One fourth or more of the lead burned is retained in exhaust system deposits or is discarded during changes of lubricating oil and oil filters. Most of the lead in exhaust gas is in the form of inorganic particulate solids composed of lead halide (PbCl•Br), or complexes of ammonium halide and lead halide. Studies of the organic lead content of exhaust gas have shown