RADIOACTIVITY AND X-RADIATION

490 Distribution of Cs-137 After Endotracheal Administration. G.K. Korolev. Federation Proc. 25, Part II (Translation Supplement) T95-T98 (Jan.-Feb. 1966).

Following entry of Cs-137 into the respiratory organs, rapid absorption of the isotope takes place. During the first 24 hours almost 90% of the injected isotope is removed from the lungs. The absorption of Cs-137 from the lungs obeys an exponential rule. Of the total amount of isotope, 84% has a half-life period of 43 minutes, 15.5% a half-life period of two days, and 0.5%—of 30 days. The largest amount of Cs-137 is deposited in the muscles (about 46% of the injected dose). The liver follows in second place (about 10%). The maximal concentration of the isotope during the first 24 hours is found in the kidneys, liver and heart. In the remaining organs the accumulation of isotope is approximately uniform. In the subsequent period no significant differences between the Cs-137 concentration in the internal organs can be found. On the 10th day after endotracheal injection of Cs-137 in a dose of 0.4 microcurie/g. (absorbed dose 161 rad.), extensive hemorrhages, perivascular edema and degenerative changes develop in the lungs in the endothelium of the blood vessels, the epithelium of the bronchi and the muscles. Subsequently, these inflammatory and degenerative changes are replaced by proliferative processes.

-- Author's conclusions

491 Metabolism of Sr-90 in Rats Fed High-Calcium Diet. L.A. Buldakov and R.A. Erokhin. Federation Proc. 25, Part II (Translation Supplement) T99-T102 (Jan.-Feb. 1966).

Under conditions of long-term administration of Sr-90 by the gastric route of rats on a high-calcium diet, the content of the isotope in the skeleton is increased for 150 days to a level of 351 $\pm$ 43.2% when the diet includes 2.4% calcium, or 639 $\pm$ 71% when the diet includes 1.4% calcium, of the daily dose of isotope. When the calcium content of the diets is high (2.4%), accumulation of Sr-90 in the skeleton on the 200th day is greater in males than in females. After long-term administration of the isotope, accumulation of Sr-90 in the skeleton of periodically pregnant and lactating rats on the 200th day was 30% higher in pregnant rats. The Sr-90 content in the muscles of pregnant and nonpregnant females did not exceed 5.23 $\pm$ 7.4% of the daily dose; its concentration was only 1/150 - 1/300 that in the skeleton. -- Cond. from authors' conclusion

492 Ergogenic Effects of Breathing Artificially Ionized Air. H.A. DeVries and C.E. Klafs. J. Sport Med. (Torino) 5, 7-12 (March, 1965).

An experimental design was constructed to evaluate the breathing of negative ions as a practical ergogenic aid, when used immediately preceding an all-out physical performance involving the factors of muscular endurance, cardio-respiratory endurance, and motivation. Forty-five subjects (21 male and 24 female) each acted as his own control in that he was tested on different days following 15-minutes exposure to each of the following conditions: (1) breathing negatively ionized air, (2) breathing positively ionized air, (3) place (breathing air from a dummy machine), and (4) control (breathing normal ambient room air). ..atistical treatment of the data by analysis of variance techniques indicated that although differences in mean bench-stepping time were observed, they did not achieve significance at the .05 level. The mean differences observed for the 24 women subjects were in the direction of the hypothesis that exposure to negative ions would improve physical performance, but also did not achieve significance at the .05 level of confidence. The authors suggest that further experimentation should be undertaken and outline the areas they deem particularly important. -- Aerospace Med. Absts.

493 Changes in Blood Serotonin Level in Animals Exposed to Ionizing Radiation and Dynamic Factors of Space Flight. V.V. Parin, et al. Federation Proc. 25, Part II (Translation Supplement) T103-T106 (Jan.-Feb. 1966).

In the animals investigated (monkeys, dogs, guinea pigs, rats and mice), two types of changes were observed in the serotonin concentration in the blood in acute radiation sickness following whole-body gamma-ray irradiation from Co-60. In dogs, monkeys and guinea pigs the disturbance of the blood serotonin concentration was very marked and depended on the severity of the radiation sickness, whereas in rats and mice the fall in the serotonin concentration was less marked and independent of the severity of the radiation sickness. In the animals of the first group a clear hemorrhagic syndrome developed in the course of the radiation sickness; no hemorrhages were observed in those of the second group. The main cause of the fall in the blood serotonin level in radiation sickness is disturbance of its formation in the alimentary tract. The serotonin concentration in the blood of mice and dogs flying on the (Russian) satellite-spaceships four and five (determined by a biological method on the isolated segment of rat's intestine) 24 and 48 hours

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