

of body weight was greatly prolonged in wasting mice, and fixation of liver glycogen was decreased. These results suggest that liver function is impaired in secondary disease. Reticuloendothelial activity was increased but did not differ from that of mice injected with isologous spleen cells. The significance of this result remains to be determined. (auth)

10693 (USNRDL-TR-474) EFFECT OF REPEATED ROENTGEN AND NEUTRON IRRADIATION ON THE HEMATOPOIETIC SYSTEM. S. J. Baum, A. K. Davis, and E. L. Alpen (Naval Radiological Defense Lab., San Francisco). Oct. 24, 1960. 26p. Contract MR 005.08-1200.

Groups of six mongrel dogs were subjected repeatedly to either 150 rads of x rays or 150 rads of neutrons at 3-month intervals. A third group of six nonirradiated dogs was the control for any possible age or seasonal effects. After each of the four irradiation exposures, various hematological parameters were studied. It was observed that, while the dog normally incorporates nearly all the injected  $Fe^{59}$ , a 150-rad dose of either x rays or neutrons reduces iron uptake to 70% of the injected dose. Similarly to what was previously reported for the rat, with each repeated irradiation a reduction below the iron incorporation value obtained in the previous exposure may be observed. The data may again best be described with a simple exponential equation. Although hematocrit values did not change until after the third irradiation, the erythrocyte volume decreased continuously, which further implicates residual radiation effects to the erythropoietic system. The employed radiation dose caused the characteristic decrease in peripheral leukocyte and platelet values, and complete recovery was not observed with repeated exposures. In general, the effects of x irradiation on leukocyte and platelet counts appeared to be greater than those of neutron irradiation. Finally, whereas four out of six x-irradiated dogs died after four replicated exposures, only one neutron-exposed dog did not survive. (auth)

10694 (USNRDL-TR-482) HYPOCALORIC FEEDING AND RADIATION TOLERANCE. H. W. Carroll and R. W. Brauer (Naval Radiological Defense Lab., San Francisco). Nov. 29, 1960. 19p.

Experiments were performed to compare the radiation sensitivity and the dose mortality curves of hypocalorically reared rats and freely fed controls. The radiation resistance of hypocalorically reared rats is significantly reduced when compared to freely fed controls. The LD 50/30 of the rats on the hypocaloric regime in these experiments was  $624 \pm 24$  rad as compared to  $709 \pm 32$  rad for normally fed controls. Food intake and body weight changes showed the usual period of anorexia and body weight losses after irradiation in the rats fed ad libitum, whereas, hypocalorically reared rats displayed no recognizable body weight loss nor anorexic responses to radiation exposure. No apparent sizeable differences were observed with regard to pattern of mortality between the hypocalorically reared rats and rats fed ad libitum. The decreased radiation resistance of the hypocalorically reared rats does not appear to be attributable either to the size of the rats or to the extended life span of these animals. (auth)

10695 (WRU-400) A STUDY OF THE PHYSIOLOGICAL FUNCTION AND HISTOLOGICAL CHANGES OF THYROIDS IRRADIATED WITH RADIOACTIVE IODINE. Progress Report and Proposal for Continued Research October 1, 1959–October 1, 1960. Brown M. Dobyns (Western Reserve Univ., School of Medicine, Cleveland). [nd]. Contract AT(30-1)-1243.

Progress is reported in studies on the physiological and

morphological effects of  $I^{131}$  radiation on the thyroid. Data are included on the physiological changes produced in human thyroids after the administration of therapeutic doses of radioactive iodine. Serial quantitative chromatograms on the blood of 115 patients were studied. During the first few days the observations essentially reflect unaltered function of the thyroid, but with the passage of time the observations reflect the effects of radiation. The changing patterns of iodinated compounds in the blood, alterations in rate of return of the radioactivity to the thyroid, and the subsequent testing of the functional capacity of the gland permit an analysis of the effects of radiation. Preliminary results are reported from combined acute and chronic experiments in rats on the effects of various doses of  $I^{131}$  at various time intervals and with and without thiouracil. Tritiated iodine was used in studies on the effects of  $I^{131}$  on the uptake of thymidine by nuclei of thyroid cells. Measurements were also made of the levels of desoxyribonucleic acid in individual cells at intervals of 5 to 90 days after the administration of various doses of  $I^{131}$ . (C.H.)

10696 (JPRS-7666(p.42-61)) THE RADIOSENSITIVITY OF NERVE CELLS OF THE RAT CEREBELLUM TO THE EFFECT OF  $\beta$ -RADIATION. A. A. Manina. Translated from Tsitologiya, 2: No. 3, 287-95(1960).

By means of the experimental-morphological investigation of the effect of different doses of radioactive phosphorus on the nervous systems of white rats, it was possible to determine the critical periods in the development of the nerve cells of the cerebellum, at which time the latter are sensitive to  $\beta$ -radiation. Neuroblastic elements at the early stage of development possess the highest sensitivity to  $\beta$  radiation, which exerts a primary pathogenic effect and produces the death of cells several hours after the administration of  $P^{32}$ . The period of high radiosensitivity of cells is brief and is not simultaneous for the various cellular elements of the same layer. Differentiated mature nerve cells possess a high degree of resistance to  $\beta$  radiation, which even in high doses does not cause a primary pathological effect. However, reactive phenomena in them can be followed morphologically. They are manifested as a change in the nature of the arrangement of basophilic substance and different degrees of chromatolysis in it, reflecting changes in the nucleic and protein metabolisms in the nerve cells. The pathological effect depends more on the stage of development of the various parts of the central nervous system of the embryo than on the strength of the effect, determined by the dose of the irradiation. Doses of  $P^{32}$ , which are almost harmless to the adult organism, cause very severe pathological changes and cerebral lesions in embryos and in the newborn. (auth)

10697 (JPRS-7666(p.83-97)) INVESTIGATION OF THE REACTION OF BONE MARROW CELLS OF ANIMALS TO THE EFFECT OF IONIZING AND ULTRAVIOLET RADIATION BY THE METHODS OF ULTRAVIOLET AND FLUORESCENCE MICROSCOPY. M. P. Bukhman and T. M. Kondrat'eva (Kondrat'yeva). Translated from Tsitologiya, 2: No. 3, 309-17(1960).

Under the influence of the effect of penetrating radiation on the animal organism, definite changes occur in bone marrow cells before any noticeable structural injuries. The absorption of the UV rays is shifted to the direction of the long waves. The least differences between the absorptions by experimental and control cells are observed at wavelengths of 280 to 254 m $\mu$ ; the greatest differences at a wavelength of 365 m $\mu$ . There is a considerable increase in the absorption of ultraviolet rays of this wavelength by