Peiping Section.

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Studies on Radiation Leucopenia. I. Effects of Pentnucleotide in Rabbits.

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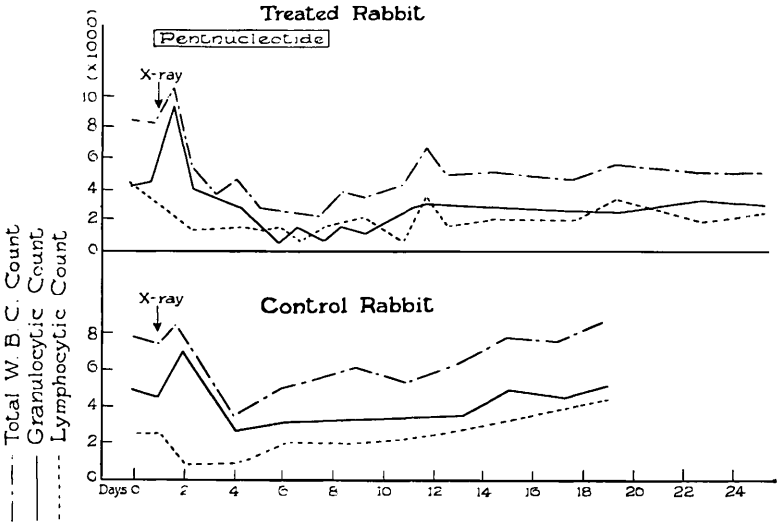
Recently, nucleic acid salts have been widely used in the treatment of agranulocytosis with encouraging results. It seems, therefore, that this form of treatment might also be applicable to leucopenia produced by radiation.

Normal, female rabbits of from 3 to 4 months old were used. The leucopenia was induced by roentgen radiation. A single exposure (650 r units corresponding to 100% E.S.D.) of 46½ minutes duration was given over the dorsal aspect of the body excluding the head. The factors were 130 K.V., 4 ma., 6 mm. Al. filtration, 30 cm. skin-target distance. Immediately after the termination of the radiation, 2.5 cc. (0.175 gm.) of pentnucleotide* was injected intravenously and then twice daily for 10 consecutive days. Daily R.B.C. and W.B.C. counts, Hb. determinations (Sahli), and differential W.B.C. counts (Wright's stain) were made with blood taken from the ear vein, at the same hour of the day, both before radiation and for an average period of 4 weeks after radiation. The control series included 8 rabbits; of which 3 received radiation without pentnucleotide, 3 received pentnucleotide without radiation, and 2 were given 2.5 cc. of a watery solution of 0.3% cresol (containing no pentnucleotide) twice daily for 10 days. The weight, temperature, and the general appearance of the animals were noted three times a week.

*A watery solution of the sodium salts of pentose nucleotides preserved with 0.3% cresol (Smith, Kline & French Laboratories, Philadelphia).



In the animals that received pentnucleotide alone, there was marked increase in the total number of granulocytes and lymphocytes, which appeared on the sixth to tenth day and lasted throughout the period of observation. The rabbits that received cresol solution alone showed no appreciable change in the W.B.C. count. Those which had radiation alone suffered a definite reduction in the total number of W.B.C. occurring between the 3rd and 5th days following the exposure, after which there was a gradual rise, with return to normal between the fifteenth and seventeenth days. A typical case is represented in the lower chart of the accompanying figure. The rabbits which received radiation and pentnucleotide, displayed essentially the same type of reaction to the radiation as did those of the preceding group. See upper chart of the figure. The general appearance, weight, temperature, R.B.C. count, and Hb. of all the rabbits remained unaffected throughout the period of observation.

It seems that practically no effect can be attributed to the pentnucleotide. This may be due to a depression of the bone marrow by the roentgen rays, independent of the metabolism of nucleic acid.