



DOE Openness: Human Radiation Experiments: Roadmap to the Project



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Letter to Lt. Col. H.L. Friedell from Robert M. Fink December 5, 1945.

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ARMY SERVICE FORCES
UNITED STATES ENGINEER OFFICE
 MANHATTAN DISTRICT
 Oak Ridge, Tennessee

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December 5, 1945

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Lt. Col. H. L. Friedell
 U.S. Engineer Corps
 Manhattan District
 P. O. Box 8
 Oak Ridge, Tenn.

RHTG #72,930
BOX # 603

Dear Col. Friedell:

This letter summarized much of our recent work on the metabolism of polonium. We trust it may be of use in connection with the forthcoming conference on polonium tolerance. Most of this work is now in various stages of being written up as full reports which will be ready for distribution in the near future.

Lethal Dose Studies with Rats.
Preliminary Series.

Our preliminary lethal dose experiments are now essentially finished. They gave average survival times for polonium injected rats ranging from 6 days for animals receiving 170 $\mu\text{c}/\text{kg}$. intravenously to 19 days with 50 $\mu\text{c}/\text{kg}$. The data indicated that for a 20-day period after injection polonium, on a per curie basis, was approximately 2 times as toxic as plutonium and 90 times as toxic as purified radium in which the polonium concentration had been reduced to 0.05% of its equilibrium value. High doses (800 to 1400 $\mu\text{c}/\text{kg}$.) of radium containing 0.5% of the equilibrium amount of polonium were found to be 2 to 4 times as toxic as the purified radium. The lowest dose of radium given in the experiments (20 $\mu\text{c}/\text{kg}$.) gave an average survival time of 335 days. Pathology studies of the polonium group showed marked changes in the hematopoietic system, unimpressive liver changes and visceral hyperemia for all doses from 50 to 170 $\mu\text{c}/\text{kg}$. The high dose groups also showed pronounced bowel changes.

Final Series.

A more ambitious lethal dose experiment for comparing Po, Pu, and Ra simultaneously with 20 Mistar rats at each dosage level has now been under way for 60 days. In the polonium group of this experiment 50 $\mu\text{c}/\text{kg}$. intravenously killed half the rats in 15 days, 45 $\mu\text{c}/\text{kg}$. in 25 days, and 32 $\mu\text{c}/\text{kg}$. in 50 days, and polonium showed on a per curie basis 1.4, 1.8, and 1.8 times the toxicity of plutonium and 34, 40, and 28 times the toxicity of radium (with 1.0% Po) in 15, 25, and 50 day

Classification Changed to UNCLASSIFIED
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 DIVISION OF HEREN, ANALYSIS CORP. *ELIY*

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