[redacted] UNCLASSIFIED [redacted]

Address Reply to:
District Engineer
Manhattan District
Corps of Engineers
Oak Ridge, Tennessee
Attn: Mr. Harold F. Plank

WAR DEPARTMENT
CORPS OF ENGINEERS
Office of the District Engineer
MANHATTAN DISTRICT
Oak Ridge, Tennessee

CLINICAL LABORATORIES
CENTRAL FILES NUMBER
46-12-325
[redacted]

26 December 1946
Date

Refer to File No. EIDMK-80

Classification Cancelled
~~Or Changed To~~
By Authority Of
By [illegible] Date AUG 24 1971

726785

FOLDER
BOX No. CF-46-12-325
COLLECTION SP Central Files
REPOSITORY MMES-ORNL

In accordance with agreements reached at meetings of the Manhattan Project Editorial Advisory Board on 10, 11 June 1946 and 13, 14 August 1946, the attached abstract of a paper entitled:

"Metabolism of Plutonium"

by **W. Langham, et.al.**

describing work done at **Los Alamos** under contract with the Manhattan Project, is submitted for your information and appropriate action as an Editorial Board member. Publication of this paper in advance of the Manhattan Project Technical Series is contemplated by the authors.

In accordance with the MPEAB recommendations, it is requested that you fill in the Reply Form below forwarding the original to the District Publications Section and retaining the copy for your records. Please expedite your reply, which should reach the District Publications Section within ten days from the date of this letter. If your reply is not received by the District Publications Section within ten days of the date of this letter, it will be assumed that your installation has no comments to make about the paper.

For the District Engineer:

Very truly yours,

CLASSIFICATION CANCELLED
[illegible] ORO-CO 3/3/95
ADD signature Date
Single rereview of CCRP-declassified documents was authorized by DOE Office of Declassification memo of August 22, 1994.

[illegible]
HAROLD F. PLANK,
Asst. to Chief, Publications Section,
Research Division.

REPLY FORM

To: Publications Section, USED, P. O. Box E, Oak Ridge, Tennessee.

It (is) ~~(is not)~~ recommended that the paper described by the abstract inclosed with the above letter be cleared for publication without an opportunity being afforded for the undersigned to scrutinize the complete paper.

EIDM FORM 540 (Revised 19/11/46)
1185355
[redacted] UNCLASSIFIED [redacted]

A-00635
Human Studies Project

Request (is) (is not) made that the District Publications Section arrange for a copy of the paper referred to above to be furnished to the undersigned.

The undersigned (is) (is not) making arrangements directly with the authors for review of the paper referred to above.

Copies of correspondence relative to this paper will be furnished to the District Publications Section by the undersigned.

Board Member, Manhattan Project
Editorial Advisory Board.

1185356

MDC 222

[redacted]

CCRP re-review
ORO-CO 3/3/95

METABOLISM OF PLUTONIUM

Classification Cancelled
Or ~~Changed To~~
By Authority Of
By
Date AUG 24 197

by - W. Langham, et.al.

ABSTRACT

The first day following intravenous injection of $PuO_2(NO_3)_2$ the urinary excretion of plutonium was 7.5 per cent of the dose as compared to 0.33, 0.57, and 0.71 per cent when administered as $PuCl_3$, $Pu(NO_3)_4$, and Pu^{+4} citrate complex respectively. Fecal excretion during the first day was correspondingly lower following injection of $PuO_2(NO_3)_2$. On the thirtieth day following intravenous injection there were no significant differences in either urinary or fecal excretion of plutonium administered as $PuCl_3$, $Pu(NO_3)_4$, Pu^{+4} citrate complex, and $PuO_2(NO_3)_2$. At this time the average urinary excretion was 0.014 per cent of the injected dose and the average fecal excretion was 0.22 per cent. The average ratio of fecal to urinary excretion was 16/1.

The skeleton was a major site of deposition regardless of the form in which the plutonium was injected. Four days following injection of plutonium as $PuCl_3$, $Pu(NO_3)_4$, Pu^{+4} citrate complex, and $PuO_2(NO_3)_2$ skeletal deposition was 44.9, 29.3, 56.9, and 56.5 per cent of the injected dose respectively. Deposition in the liver under the above conditions was 22.9, 39.7, 9.6, and 9.1 per cent of the injected dose respectively. Deposition of plutonium in kidney, spleen, and in "balance" was not greatly affected by the form in which the plutonium was administered.

The size of the injected dose of Pu^{+4} citrate complex did not affect the per cent of the dose excreted in the feces and urine. Likewise, the size of dose did not alter the percent of injected material present in the various tissues six days following injection.

Absorption of plutonium from the gastro-intestinal tract was quite low --

1185367

0.01% of the administered dose. When Pu^{+4} was administered orally in 5 per cent sodium citrate solution, the presence of the citrate seemed to increase absorption of the plutonium from the gastro-intestinal tract. Absorption was still quite low -- only 0.3 per cent of the administered dose.

Seventy-nine per cent of the plutonium absorbed from the gastro-intestinal tract was deposited in the skeleton and 7.3 per cent in the liver. Plutonium absorbed slowly via this route seems to give a higher deposition in the skeleton than it does when administered intravenously as $PuCl_3$, $Pu(NO_3)_4$, Pu^{+4} citrate complex or $PuO_2(NO_3)_2$.