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 Willard F. Libby  
 Commissioner

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 Division of Biology and Medicine

EXCRETION OF Y-90 FROM Sr-90 BODY BURDEN; RADIATION DOSES IN NATURE

SYMBOL: EMBP:RAD

Excretion of Y-90 from Sr-90 body burden

There are several papers in the literature which indicate that Y, following intravenous injection, is retained very persistently by the body. As examples, you might be interested in the work by Comar<sup>(1)</sup> in cattle; Capp, Axelrod, and Hamilton<sup>(2)</sup> in rats; Rayner, Tutt and Vaughan<sup>(3)</sup> in rabbits; and Kidman, Tutt, and Vaughan<sup>(4)</sup> in rabbits. In the last 3 examples the retention of Y and Sr was directly compared, and Y was the greater. Arnold at Utah, as I mentioned to you orally, found for dogs not only that the Y-90 was essentially 100% retained in the body, but also that it remained at the site of the parent Sr-90 atoms without redistribution within the body.

The absence of Y and rare earths in animal skeletons can be explained, as you suggested, by the low gut uptake of these elements. In the National Bureau of Standards Handbook 52, comparative gut uptake of Y and Sr is given as 1:1000.

Comparative Sr-90 and natural radiation doses -

The radiation dose rate resulting from 1 S.U. Sr-90 body burden in comparison with natural radiation is approximately as follows:

1 S.U. Sr-90	$5 \times 10^{-6}$ rep/day	(skeleton)
Cosmic rays (sea level)	$10^{-4}$	(whole body)
Natural radioactivity in environment	$10^{-4}$	(whole body)
K-40 in body	$10^{-4}$	(whole body)
Ra in body	$5 \times 10^{-5}$	(skeleton)
C-14 in body	$3 \times 10^{-6}$	(whole body)

CC: Dr. Dunham, B&M  
 Dr. Pearson, B&M

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REFERENCES

(Ltr. dtd. 10/25/54 fr R.A.Dudley to W.F.Libby)

- (1) Conner, OEO-98, UT-AEC Agricultural research program quarterly research progress report, January-June 1953. (July 20, 1953)
- (2) Cepp, Axelrod, and Hamilton, Am. J. Roent. and Ra Therapy 53 10 (1947)
- (3) Rayner, Tutt, and Vaughan, Brit. J. Experimental Pathology 34 138 (1953).
- (4) Kidman, Tutt, and Vaughan, Jour. of Pathology and Bacteriology 62 209 (1950).