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Date

**CONFIRMATION OF RADIOACTIVITY IN THYROIDS OF
VARIOUS ANIMALS. II**

Progress Report:
September 30, 1954 to January 10, 1955

Ralph L. Gunther

January 1955

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CONFIRMATION OF RADIOACTIVITY IN THYROIDS OF
VARIOUS ANIMALS. IIProgress Report:
September 30, 1954 to January 10, 1955**DECLASSIFIED**

Ralph L. Gunther

Donner Laboratory of Biophysics and Medical Physics
and Radiation Laboratory, Department of Physics
University of California, Berkeley, California

January 1955

This work continues the investigation into I^{131} activity found in animal thyroids, as reported in UCRL-2689. Enough data have now been accumulated to indicate a possible trend of results of a new level of radioactivity. This report also supersedes UCRL-2772, a previous progress report in which an error was made in interpretation of instrument standardization.

METHODS

Methods and techniques are essentially the same as previously reported, except that the amount of thyroid tissue placed in the 50-ml beaker for counting was limited to 4 to 10g weight for reasons of improved geometry. The tissue was always selected from the center of a given lobe, and the left lobe was the one usually used where a choice was possible. Instrument standardization was 4.0×10^{-6} $\mu\text{c}/\text{cpm}$ on December 5, 1954, and agreed closely with that made a month previously, although there was a tenfold difference in activity of the I^{131} standard employed. Backgrounds range from 70 to 80 cpm for different experiments. Error due to statistical fluctuations in count is not included in the data because it appears to be considerably less than the variation due to biological and sampling error. Exception is made in the inclusion of instrument error for single human thyroid samples to show that although the activity was usually statistically significant, it was often just barely above the extreme limit of instrument sensitivity.

DATA

Findings are presented in the accompanying table, to which notes are appended.

Exp. No.	Date of Death (1954)	Animals (H=Human)	Geograph. Origin ^(h)	Conditions ⁽ⁱ⁾	No. of Samples	Experim. Variance (%)	Specific Activity ^(a) ($\mu\text{c/g}$)
IV	9/30	Cows	C	RF	5	-	*
VI	10/1	Cattle & Sheep	Local	A	5 ^(b)	80	26
a		Cattle			3	50	7.0
b		Sheep			2	20	45
V	10/7	Steers	NC	FLF	5	15	390
VI a	10/11	Cats & Dogs	Local	A	3	-	*
VII	10/12	Steers	NC	RF	6 ^(b)	95	180
					3	20	320
					3	22	26
				NTNT	2	40	3.1 \pm 1.1(f)
VIII	10/13	Cattle	NC	FLF	7 ^(b)	>100	240
					3	34	540
					4 ^(d)	75	15
IX	10/15	Cattle	NC	FLF	5	19	520
				RF	2	35	650(e)
				NTNT	2	< $\sqrt{N/t}$	0.8 \pm 0.3(f)
XVI a	10/17	H	Richmond	43; anoxia	1	-	38
b	10/18	H	Richmond	58; accident	1	-	*
XF b	10/18	Dog	Local	A	1		28
		Sheep			1	60	5.2
		Horse			1		29
X	10/22	Steers	Livermore	FLF	9	36	3.5 \pm 1.9(f,g)
XII	10/27	Bulls	C	?	4	80	27
XIV	10/28	H	Local	Lung CA	1	-	33
	10/29	H		?	1	-	*
	10/31	H		?	1	-	*
	11/4	H	Martinez	74; accident	1	-	*
XVI c	11/4	H	Martinez	60; pulm.edema	1	-	7.8 \pm 3.9(c,f)
XIII	11/5	Steers	C	FLF (locally)	6 ^(b)	237	45
					1	-	260
					3	40	2.6 \pm 0.9(f)
					2	-	*
XVI d	11/7	H	Walnut Creek	60; coronary	1	-	4.4 \pm 1.5(f)
XV	11/12	Cows	C	RF (9 yrs old)	5	70	39
XVIII b	11/19	H	Walnut Creek	66; valvulitis	1	-	*
	11/20	H	Antioch	57; hemorrhage	1	-	15 \pm 2(f)
XVII a	11/23	Cows	C	RF	4		34
		Steers	C	RF	3	34	29
XX	11/26	H	Local	?	1	-	4.0 \pm 1.2(f)
XIX	12/3	Cows	C or Nev.	RF	5	82	84
XXI	12/14	Steers	Los Bantos	FLF (young)	7	43	5.9
XXII	12/16	Cows	C	FLF (old)	6 ^(b)	123	92
					2	2	250
					4	43	13
XXIII	12/16	H	Local	71; Lung CA	1	-	4.3 \pm 1.2(f)
	12/17	H	Local	Aneurism	1	-	4.0 \pm 1.2(f)
XXIV a	12/18	H	Local	Aneurism, CA	1	-	9.5 \pm 2.2(f)
b	12/18	H	Local	15; Erythematosis	1	-	74
c	12/22	H	Local	65; Lung CA	1	-	5.2 \pm 1.4(f)
d	12/22	H	Local	27; Terato CA	1	-	9.3 \pm 2.3(f)
e	12/22	H	Local	Brain Tumor	1	-	5.7 \pm 1.6(f)
XXV	12/28	Cows	C	RF (7 yrs old)	7	38	19 \pm 10(f,g)
XXVI a	1/10/55	Heifers	NC	FLF	1	-	*
b							

Notes referred to in table.

* These activities were not detectable, i.e., less than $\sim 2 \times 10^{-6}$ $\mu\text{c/g}$.

- (a) Above background.
- (b) This is the analysis averaged over the total number of samples. Figures immediately below on same date are an average breakdown of the actual activities where these values seem to group themselves at extremes. See Discussion for further detail.
- (c) These values are included because readings consistently above background were obtained. The statistics are not really good enough to be conclusive.
- (d) Three of the samples agreed within 30%. Histological sections were made of these low-activity samples and (if there was any question of identity) have verified that they were actually thyroid.
- (e) It is to be noted that this is probably not a difference due to feeding. That feeding does not seem to be an important factor is borne out by subsequent determinations.
- (f) Error due to instrument statistics.
- (g) Error due to experimental variance.
- (h) For human samples this is the place at which death occurred. Cities listed are all in northern California. C = California; NC = Northern California.
- (i) A = Autopsies; various causes of death
CA = Carcinoma
FLF = Feed-lot-fed animals
NTNT = Nonthyroid neck tissue
RF = Range-fed animals
71 = Individual age of human being at time of death.

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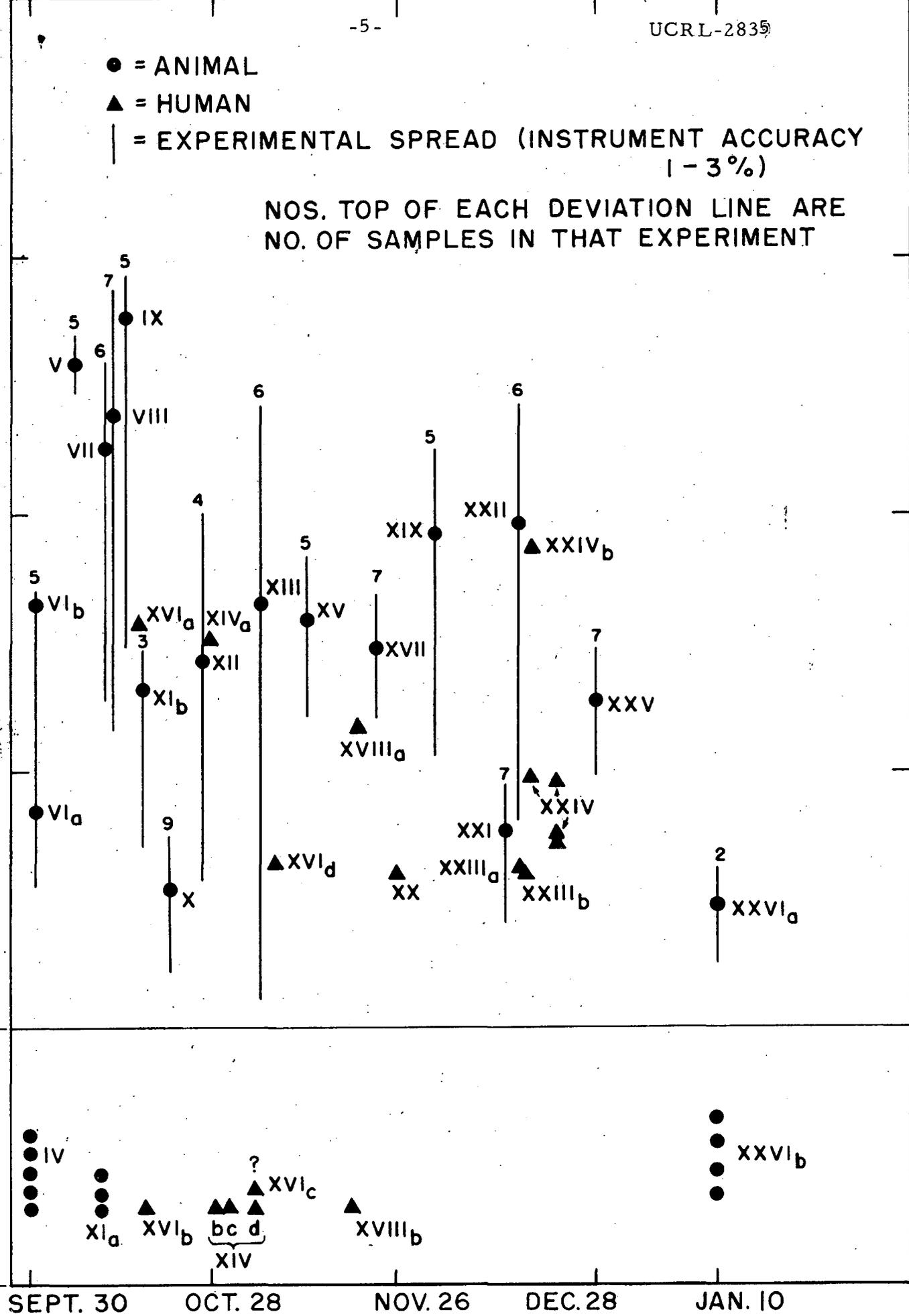
● = ANIMAL
 ▲ = HUMAN
 | = EXPERIMENTAL SPREAD (INSTRUMENT ACCURACY 1-3%)

NOS. TOP OF EACH DEVIATION LINE ARE NO. OF SAMPLES IN THAT EXPERIMENT

SPECIFIC ACTIVITY $\mu\text{c}(\text{I}^{131})/\text{GRAM THYROID}$

10^{-3}
 10^{-4}
 10^{-5}
 10^{-6}

BELOW
 DETECTABLE
 LEVEL



SEPT. 30 OCT. 28 NOV. 26 DEC. 28 JAN. 10

1954

1955