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HASL-S-1

**ANALYTICAL BRANCH
HEALTH AND SAFETY LABORATORY**

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SUMMER REPORT

March 30, to July 30, 1956

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CLASSIFICATION CANCELLED

DATE 4-22-59

For The Atomic Energy Commission

Christ
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September 1, 1956

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SUMMARY

1. World-wide fallout as measured at 96 stations has continued during the months of June and July. Values range from 47 to 16 millieuries per square mile per month (all data extrapolated to January 1, 1955), excepting an isolated value of 85 millieuries per square mile per month for June.
2. Fallout analyzed at three stations during the months of June and July showed from 0-1.5% Sr^{90} content.
3. A comparison of gummed paper with a high-walled stainless pot has been made. The data shows extreme variability and the experiment is being continued with duplicates of each method.
4. The Sr^{90} content of wet and dry milk showed a rise to 6.1 d/m/qt. during early July. August values are below 1 d/m/qt.
5. Upper air samples (jet aircraft) taken near the test site prior to Castle showed Sr^{90} to total activity percentages of from 0.8-3.9. (auth)

I. World-wide Network

Maps of the fallout (microcuries per square mile as of January 1, 1954) are given for the period of the Castle series and for the months of June and July. Most of the stations in the United States and the Pacific Area are not shown.

The most remarkable feature during the period when Castle was in progress is the distribution of high fallout in the central latitudes and the relatively slight diffusion north and south. This same pattern continues in June, but is beginning to disappear in July. The monthly fallout for the higher latitudes is greater for June and July than for the Castle period.



WORLD SHIPPING NETWORK
 (EXCLUDING THE UNITED STATES)
 RAILROAD NORTH OF JUNE
 1955
 BELLETTRES PER SQUARE MILE
 EXTRAPOLATED TO JAN. 1, 1955



WORLD SAMPLING NETWORK
 (Excluding the United States)

FALLOUT: MONTH OF JULY

Note:
 Millicuries per square mile
 Extrapolated to Jan. 1, 1955

II. Fallout of Sr⁹⁰ at selected sites during June and July.

Daily gummed paper samples of settled dust collected at Weather Bureau Stations situated at Las Vegas, Nevada; Kwajalein, Marshall Islands; and LaGuardia Airport, New York were combined, and analyzed for Sr⁹⁰. Results for replicate stands at these locations are tabulated below:

Station	JUNE 1954		
	Total Activity d/m/μ ² /month ^{1/}	Sr ⁹⁰ d/m/μ ² /month ^{11/}	Sr ⁹⁰ Total Activity
Las Vegas, Nevada	330	5.0 ± 3.4	.015
LaGuardia Airport, N. Y.	270	4.9 ± 3.4	.018
Kwajalein, Marshall Islands	1100	6.2 ± 3.4	.0056
	JULY 1954		
Las Vegas, Nevada	500	4.0 ± 2.7	.008
LaGuardia Airport, N. Y.	260	0.0 ± 4.9	-
Kwajalein, Marshall Islands	790	0.0 ± 4.9	-

^{1/} Extrapolated January 1, 1955

^{11/} Average of replicates

III. Comparison of Sr⁹⁰ collection by gummed paper and pot on the roof of the New York Operations Office March through July.

A sheet of gummed paper of the type used for fallout analysis and a 12 gallon pot was exposed for weekly intervals on the roof of the New York Operations Office building. The analyses are grouped into monthly composites for comparison.

GUMMED PAPER

Month	Total Activity d/m/Sr ⁹⁰ /month		Sr ⁹⁰ d/m/month		Sr ⁹⁰ / Total Activity	
	Gummed Paper	Roof Pot	Gummed Paper	Roof Pot	Gummed Paper	Roof Pot
March	2000	3300	15.1	17.3	.007	.005
April	4800	11,000	19.0	33.6	.002	.003
May	2000	3300	17.6	30.5	.009	.009
June	1600	1400	15.2	16.8	.009	.012
July	1200	1400	17.6	30.7	.024	.022

A statistical comparison of the weekly samples has been made by Dr. A. E. Brandt and is reported in a memo to Daniel Lynch dated July 22, 1954. A large variability is shown by both methods and the statistical correlation between the two is poor. Further tests are being made with duplicates for each method.

IV. Strontium⁹⁰ contamination of cow's milk in Metropolitan New York.

1. Wet Milk

Four quarts of milk are purchased on Monday of each week from a mid-Manhattan grocery store. This milk is wet ashed and analyzed for total radiostrontium and strontium⁹⁰ content.

Date	Total Radio Sr d/m/qt.	Sr ⁹⁰ ^{2/} d/m/qt.	Sr ⁹⁰ d/m/qt.
3-15	1.5 ± 0.3	-	1.8 ± 0.3
3-22	14.7 ± 0.8	10.3 ± 0.8	4.1 ± 0.2
3-29	6.3 ± 0.6	4.5 ± 0.8	1.4 ± 0.2
6-14	27.9 ± 4.9	27 ± 9.6	5.9 ± 1.1 ✓
6-21	23.8 ± 1.3	33 ± 1.8	- ✓
6-28	34.6 ± 0.9	45.3 ± 3.1	2.3 ± 1.3 ✓
7-5	35.1 ± 3.5	44.6 ± 6.5	3.4 ± 1.2 ✓
7-12	2.0 ± 0.6	3.0 ± 0.9	- ✓
7-19	2.6 ± 0.6	0.3 ± 1.8	2.4 ± 0.6 ✓
7-26	1.2 ± 0.6	1.2 ± 1.7	0.5 ± 0.6

^{2/} Extrapolated to 7-1-54

2. Powdered Milk

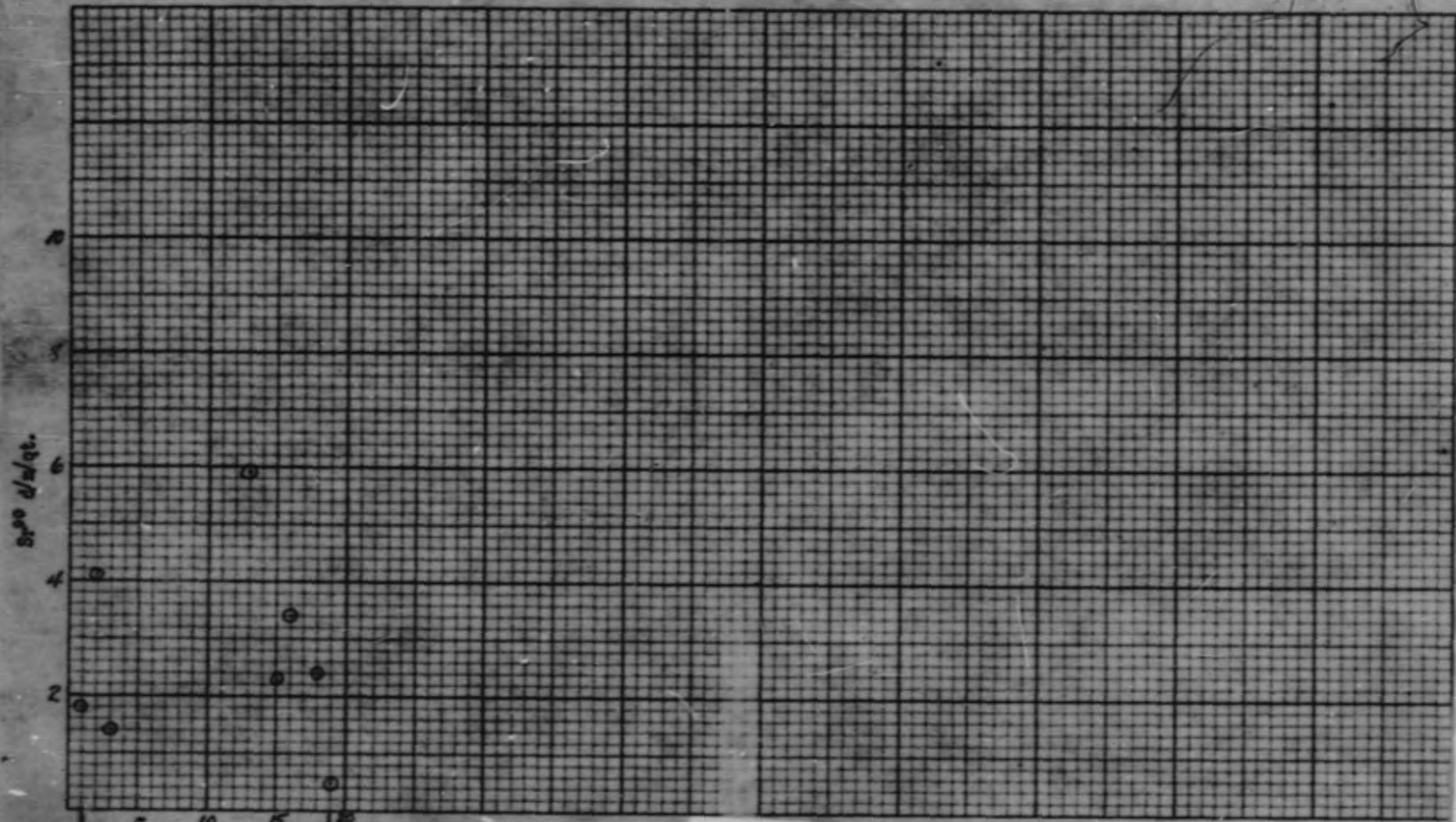
5 lbs. of powdered milk removed from each batch manufactured on Monday of each week is received from a large dairy company in the New York City Area. This milk is received from farms surrounding the Metropolitan Area and is analyzed for total radiostrontium and strontium⁹⁰ content.

Date	Total Radio Sr d/m/qt.	Sr ⁹⁰ d/m/qt. ^{2/}	Sr ⁹⁰ d/m/qt.
3-29	0.3 ± 0.2	-	0.4 ± 0.2
4-5	1.0 ± 0.2	-	1.4 ± 0.2
4-12	0.4 ± 0.2	-	0.7 ± 0.2
4-19	1.4 ± 0.1	0.5 ± 0.3	1.0 ± 0.2 ✓
4-26	-	-	-
5-3	3.2 ± 0.4	0.8 ± .09	2.6 ± .04 ✓
5-10	5.4 ± 0.3	5.0 ± 1.0	1.5 ± 0.4 ✓
5-17	7.2 ± 3.6	6.3 ± 4.5	2.2 ± .04 ✓
5-24	2.6 ± 0.5	2.2 ± 1.7	1.0 ± 0.7 ✓
5-31	3.2 ± .04	4.1 ± 0.4	-
6-7	19.4 ± 1.3	23.2 ± 2.5	2.5 ± 0.7 ✓
6-14 ^{21/}	21.4 ± 1.0 23.4 ± 0.8	31.0 ± 2.7 30.6 ± 2.7	2.7 ± 0.9 ✓ 1.8 ± 1.0 ✓
6-21 ^{21/}	22.0 ± 0.9 20.7 ± 7.7	31.4 ± 2.7 27.0 ± 10.8	2.0 ± 1.0 ✓
7-5 ^{21/}	25.0 ± 1.1 30.7 ± 1.0	21.9 ± 3.0 40.3 ± 3.1	9.4 ± 1.0 ✓ 2.9 ± 1.1 ✓
7-12 ^{21/}	13.5 ± 0.6 22.7 ± 0.7	19.6 ± 1.8 26.4 ± 2.0	1.3 ± 0.6 ✓ 5.4 ± 0.6 ✓
7-19 ^{21/}	0.4 ± 0.5 0.2 ± 0.5	0.4 ± 1.6 -	0.2 ± 0.5 ✓ 0.6 ± 0.5 ✓
7-26	1.1 ± 0.5	1.7 ± 0.8	-

^{2/} Extrapolated to 7-1-54

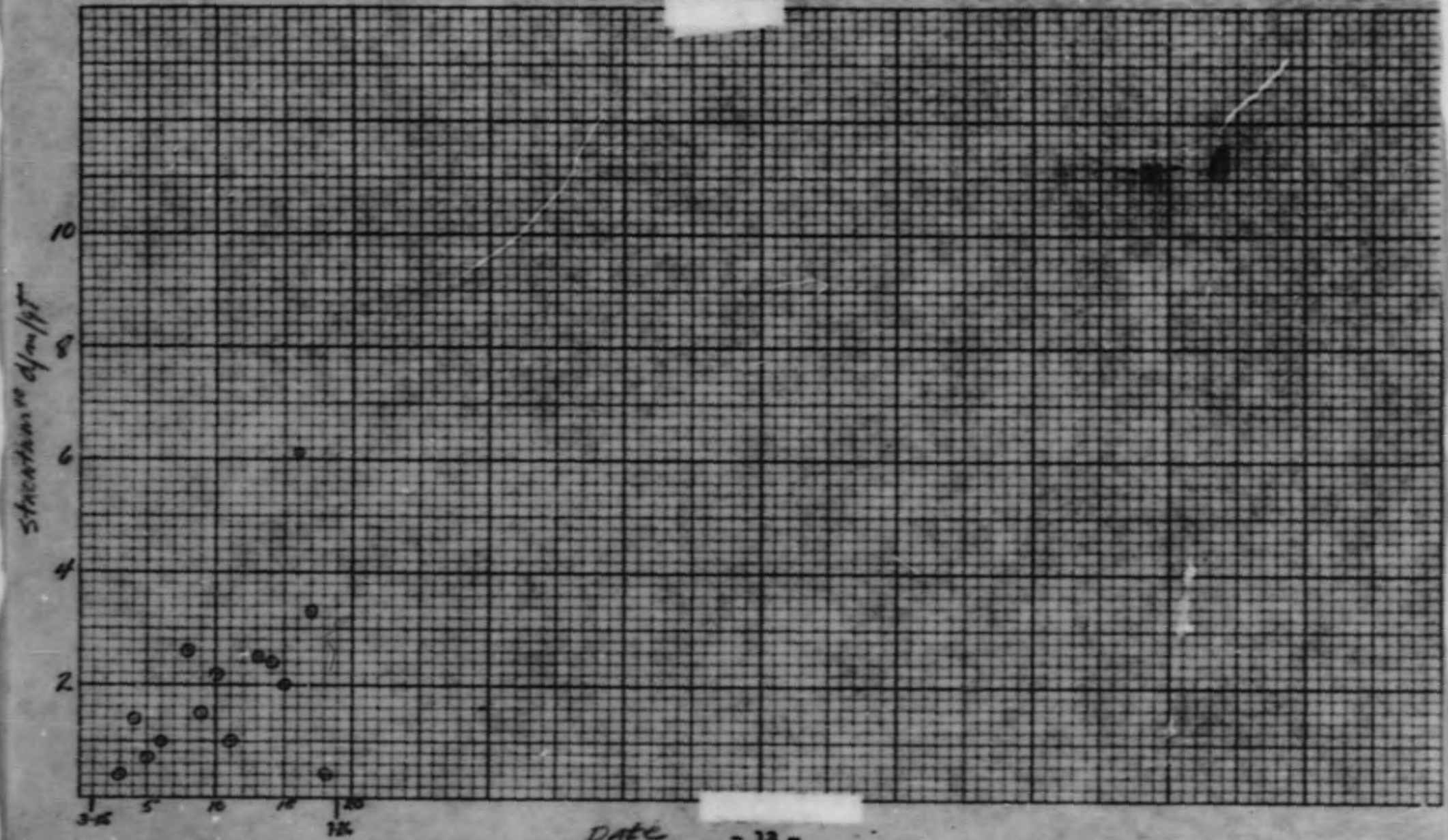
^{21/} Duplicate Analysis

Wet Milk



DATE [redacted] - 12 -

POWDERED MILK



V. Sr^{90} content of the upper air prior to Castle.

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A set of six samples collected by jet airplanes prior to Castle have been analyzed for total activity and radiostrontium. These samples were taken near the Pacific test site area at altitudes of approximately 55,000 ft.

Sample No.	Sampling Date	Total Activity d/m/sample	Sr^{90}	Sr^{90}	Total Activity
1	2/6/54	160	6.3 ± 3.2		.039
2	2/12/54	320	7.4 ± 3.2		.083
3	2/12/54	280	2.3 ± 3.2		.008
4	2/20/54	110	3.0 ± 3.2		.021
5	2/23/54	92	1.4 ± 3.2		.015
6	2/20/54	670	7.3 ± 3.2		.011

Sr^{90} values for high altitude balloon flights will be available in the next report.

VI. Sr^{90} contamination of pooled fetal bones collected during June from the Metropolitan Area.

A pooled fetal bone sample consisting of 7.61 gms of ash was analyzed for total radiocesiumium and Sr^{90} content.

Total Radiocesiumium	0.3 ± 0.5	d/s/g
Sr^{90}	-	d/s/g
Sr^{90}	0.2 ± 0.5	d/s/g
Sr^{90}	0.6 ± 1.3	d/s/g/cg

VII. Sr^{90} contamination of water supply in the Metropolitan Area
June and July.

Fifty liter samples of tap water from the Health and Safety
Laboratory were analyzed biweekly for total radiostrontium and Sr^{90} .

<u>Week</u>	<u>Sr^{90} d/m/liter</u>
5/24 - 6/1	.04 ± .02
6/8 - 6/17	.03 ± .01
6/27 - 6/29	.03 ± .01
7/6 - 7/13	-
7/20 - 8/10	.02 ± .01

END