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LOS ALAMOS SCIENTIFIC LABORATORY

OF THE UNIVERSITY OF CALIFORNIA ○ LOS ALAMOS NEW MEXICO

BETA-GAMMA RADIOACTIVITY IN ENVIRONMENTAL AIR AT LOS ALAMOS, NEW MEXICO, FOR 1961

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LOS ALAMOS SCIENTIFIC LABORATORY
OF THE UNIVERSITY OF CALIFORNIA LOS ALAMOS NEW MEXICO

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BETA-GAMMA RADIOACTIVITY IN ENVIRONMENTAL AIR AT LOS ALAMOS, NEW MEXICO, FOR 1961

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ABSTRACT

The report is a continuation of work reported in the Los Alamos section of "Radioactive Fallout Data Collected from Eleven Atomic Energy Installations for 1958", LAMS-2397 (Nov., Dec. of 1958 and all of 1959), and LAMS-2499 (for 1960). The beta activities were not identified. However, since the measurements were made in the same manner, the values are relative to one another.

The monthly average "per day" and "per sample" graphs show in general the same peaks reported by other stations, i.e., in the spring months, with marked peaking in the fall as a result of the Russian tests. Definite increases of a factor of 5-8 were noted from the second week in September onward.

Introduction

As a part of the environmental monitoring program at Los Alamos, the measurements of air particulate radioactivity, activity in precipitation and gamma background are made periodically. The sampling station is located on the roof of the Administration Building, SM-43. The samplers are on the highest part of the building -- a flat gravel covered surface, 65 feet above ground level.

The values found in the first 3 quarters of 1961 were quite low. Due to the limits of detectability we were forced to go to a weekly collection of both air and water samples from the last week in February through the last week in August, when, in anticipation of fallout from the Russian test series, we renewed daily sampling.

Gamma Background

Gamma background surveys are made daily. The readings are made at approximately 0900 when the air sampler filter is changed. The measurements are made with a G-M survey meter with the probe held 3 feet above the surface of the roof.

Beta Activity of Particulate Matter in Air

Airborne radioactive particulate matter is collected on 4-inch-diameter filters (MSA catalog number CR 17651). The sampling rate is 46 M^3/hr. Air samples are ordinarily collected for 24-hour intervals during the work week and week-end samples are collected for a 72 hour period. Filters are changed at approximately 0900. This procedure was modified this year as noted in the Introduction.

The filter papers are counted for beta activity 7 days after collection in a thin-window gas (methane) flow proportional counter, with an over-all efficiency for Sr^{90} - Y^{90} of 44 percent. Results are reported in terms of microcuries per cubic centimeter of air.

The filters are also counted 10 minutes after removal from the sampler, but these results have not been included in this report.

Beta Activity of Particulate Matter in Rain

Collection is made in an oversized rain collector which delivers one liter of water for each 0.1 inch of precipitation. The collector has a cross section of approximately 0.4 meter. The area is such that the number of d/m collected is approximately equivalent to micromicrocuries per square meter.

Even during relatively dry periods it was found that this arrangement collected activity. So, by the simple expedient of washing down the sides of the collector each time a sample is collected with about 1 liter of distilled water, and collecting the wash water, a suitable

sample could be obtained. These "wash" samples as well as any precipitation samples are reduced in volume, then dry-plated on 1-inch stainless planchets. These are then counted in a counter employing an end window Geiger tube with a window thickness of 1.9 mg/cm^2. The counting efficiency was determined by comparison with a Tracerlab standard of radiolead, which emits 1.17 Mev beta particles. Results are reported in $\mu\mu c$ per square meter at time counted.

Samples are taken daily on work days, except during periods when weekly samples were taken due to insufficient activity. The activity collected is washed with 1 liter of water for collection of the sample, usually between 0800 and 0900 on the day of collection. When precipitation occurs, the wash is added to the collected precipitation and treated the same way.

Results Reported

The results reported herein continue the measurements reported in LAMS-2397 and LAMS-2499. These results are shown in Figs. 2 and 3, and precipitation for the year is shown in Fig. 1. Table I summarizes the year's data. Average "per day" values for air collection are weighted for sample periods of more than one day. Average "per day" values for the rain gauge collection are the total activity collected during the month divided by the number of days.

FIRST QUARTER 1961

Collection Date Start	Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Time of count	Beta activity μμc/M²
Dec. 30 (1960)	Jan. 3	0.02	0	1	0	Jan. 3	1215	25
Jan. 3	Jan. 4	0.03	$<.08 \times 10^{-12}$	20	0	Jan. 4	1148	31.4
Jan. 4	Jan. 5	0.04	$<.08 \times 10^{-12}$	22	0	Jan. 5	1142	36
Jan. 5	Jan. 6	0.03	$<.08 \times 10^{-12}$	9	0	Jan. 6	1230	7.6
Jan. 6	Jan. 9	0.02	$<.08 \times 10^{-12}$	5	0	Jan. 9	1124	17
Jan. 9	Jan. 10	<0.05	$.15 \times 10^{-12}$	5	0	Jan. 10	1111	28
Jan. 10	Jan. 11	0.03	$.65 \times 10^{-12}$	13	0	Jan. 11	1050	14
Jan. 11	Jan. 12	0.03	$<.08 \times 10^{-12}$	5	0	Jan. 12	1112	9
Jan. 12	Jan. 13	0.03	$.08 \times 10^{-12}$	11	0	Jan. 13	1143	18
Jan. 13	Jan. 16	0.03	$.11 \times 10^{-12}$	12	0	Jan. 16	1107	12
Jan. 16	Jan. 17	0.02	0	8	0	Jan. 17	1104	21
Jan. 17	Jan. 18	0.04	$<.08 \times 10^{-12}$	14	0	Jan. 18	1114	29
Jan. 18	Jan. 19	0.03	$.17 \times 10^{-12}$	13	0	Jan. 19	1116	9.6
Jan. 19	Jan. 20	0.04	$.09 \times 10^{-12}$	10	0	Jan. 20	1121	18
Jan. 20	Jan. 23	<0.05	$<.21 \times 10^{-12}$	8	0	Jan. 23	1130	22
Jan. 23	Jan. 24	<0.05	$.14 \times 10^{-12}$	9	0	Jan. 24	1348	25
Jan. 24	Jan. 25	<0.05	$.18 \times 10^{-12}$	11	trace	Jan. 25	1100	61
Jan. 25	Jan. 26	<0.05	$<.08 \times 10^{-12}$	4	0	Jan. 26	1135	26
Jan. 26	Jan. 27	<0.05	$<.08 \times 10^{-12}$	29	0.30	Jan. 27	1243	101
Jan. 27	Jan. 30	0.02	$<.08 \times 10^{-12}$	- -	0.05	sample lost		
Jan. 30	Jan. 31	<0.05	$.21 \times 10^{-12}$	11	0	Jan. 31	1124	15

FIRST QUARTER 1961

Collection Date Start	Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Time of count	Beta activity μμc/M²
Jan. 31	Feb. 1	< 0.05	$< .08 \times 10^{-12}$	9	0	Feb. 1	1125	10
Feb. 1	Feb. 2	0.03	$< .08 \times 10^{-12}$	3	0	Feb. 2	1123	10
Feb. 2	Feb. 3	0.03	$< .08 \times 10^{-12}$	15	0	Feb. 3	1100	35
Feb. 3	Feb. 6	0.03	$< .08 \times 10^{-12}$	15	trace	Feb. 6	1135	16
Feb. 6	Feb. 7	0.03	0	2	0	Feb. 8	0843	0.4
Feb. 7	Feb. 8	< 0.05	$.10 \times 10^{-12}$	9	trace	Feb. 8	1205	0.12
Feb. 8	Feb. 9	0.05	0	0	0	Feb. 9	1120	5
Feb. 9	Feb. 10	0.03	$< .08 \times 10^{-12}$	0	0	Feb. 10	1113	25
Feb. 10	Feb. 13	0.04	$.97 \times 10^{-12}$	7	0	Feb. 13	1112	9
Feb. 13	Feb. 14	0.03	$< .08 \times 10^{-12}$	3	0	Feb. 14	1111	9
Feb. 14	Feb. 15	0.03	$< .08 \times 10^{-12}$	3	0	Feb. 15	1126	19
Feb. 15	Feb. 16	0.02	0	46	0	Feb. 16	1115	78
Feb. 16	Feb. 17	0.03	$< .08 \times 10^{-12}$	13	trace	Feb. 17	1132	58
Feb. 17	Feb. 24	0.03	$.10 \times 10^{-12}$	172	0.15	Feb. 24	1204	192
Feb. 24	Feb. 27	- -	- -	40	0.50	Feb. 27	1158	189
Feb. 27	Mar. 3	- -	- -	36	trace	Mar. 3	1220	92
Feb. 24	Mar. 3	0.03	$< .08 \times 10^{-12}$	- -	- -	- -	- -	- -

FIRST QUARTER 1961

Collection Date Start	Collection Date Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Beta activity counted 7 days after collection: Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Early count - Rain gauge: Time of count	Early count - Rain gauge: Beta activity μμc/M²
Mar. 3	Mar. 6	- -	- -	257	0.31	Mar. 6	1115	334
Mar. 6	Mar. 10	- -	- -	26	0.03	Mar. 10	1225	56
Mar. 3	Mar. 10	0.03	$.09 \times 10^{-12}$	- -	- -	- -	- -	- -
Mar. 10	Mar. 17	0.05	$<.08 \times 10^{-12}$	101	0.18	Mar. 17	1219	165
Mar. 17	Mar. 20	- -	- -	99	1.22	Mar. 20	1348	213
Mar. 20	Mar. 24	- -	- -	29	trace	Mar. 24	1238	61
Mar. 17	Mar. 24	0.05	$<.08 \times 10^{-12}$	- -	- -	- -	- -	- -
Mar. 24	Mar. 27	- -	- -	170	0.06	Mar. 27	1141	227
Mar. 27	Mar. 29	- -	- -	337	0.12	Mar. 29	1229	1236
Mar. 29	Mar. 31	- -	- -	207	0.45	Mar. 31	1206	262
Mar. 24	Mar. 31	0.03	$.10 \times 10^{-12}$	- -	- -	- -	- -	- -

SECOND QUARTER 1961

Collection Date Start	Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Time of count	Beta activity μμc/M²
Mar. 31	Apr. 5	- -	- -	75	0.13	Apr. 5	1156	193
Apr. 5	Apr. 6	- -	- -	21	0.12	Apr. 6	1110	61
Apr. 6	Apr. 7	- -	- -	72	trace	Apr. 7	1302	251
Mar. 31	Apr. 7	0.04	$.48 \times 10^{-12}$	- -	- -	- -	- -	- -
Apr. 7	Apr. 10	- -	- -	150	0.19	Apr. 10	1234	149
Apr. 10	Apr. 11	- -	- -	44	0.32	Apr. 11	1245	151
Apr. 11	Apr. 14	- -	- -	4	- -	Apr. 14	1314	5
Apr. 7	Apr. 14	0.03	no sample	- -	- -	- -	- -	- -
Apr. 14	Apr. 21	0.02	$.93 \times 10^{-12}$	51	trace	Apr. 21	1153	85
Apr. 21	Apr. 28	0.03	$.78 \times 10^{-12}$	24	0	Apr. 28	1218	76
Apr. 28	May 5	0.03	$.78 \times 10^{-12}$	29	trace	May 5	1214	53
May 5	May 12	0.02	$.44 \times 10^{-12}$	112	trace	May 12	1303	92
May 12	May 19	- -	$.55 \times 10^{-12}$	34	trace	May 19	1340	68
May 19	May 26	< 0.05	$.84 \times 10^{-12}$	305	0.14	May 26	1600	327
May 26	May 29	- -	- -	169	0.16	May 29	1515	252
May 29	June 2	- -	- -	18	0	June 2	1259	60
May 26	June 2	0.03	$.44 \times 10^{-12}$	- -	- -	- -	- -	- -
June 2	June 9	< 0.05	$.71 \times 10^{-12}$	157	0.02	June 9	1345	249

SECOND QUARTER 1961

Collection Date Start	Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Time of count	Beta activity μμc/M²
June 9	June 16	< 0.05	$.26 \times 10^{-12}$	131	0.21	June 16	1244	195
June 16	June 19	- -	- -	162	0.45	June 19	1523	266
June 19	June 23	- -	- -	103	0.10	June 23	1234	173
June 16	June 23	< 0.03	$.40 \times 10^{-12}$	- -	- -	- -	- -	- -
June 23	June 28	- -	- -	200	0.11	June 28	1552	352
June 28	June 30	- -	- -	44	trace	June 30	1546	107
June 23	June 30	0.03	$.55 \times 10^{-12}$	- -	- -	- -	- -	- -

THIRD QUARTER 1961

Collection Date Start	Collection Date Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Beta activity counted 7 days after collection: Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Early count - Rain gauge: Time of count	Early count - Rain gauge: Beta activity μμc/M²
June 30	July 3			279	0.26	July 3	1335	753
July 3	July 7			64	0.07	July 7	1246	134
June 30	July 7	< 0.05	$.04 \times 10^{-12}$					
July 7	July 10			296	1.47	July 10	1512	676
July 10	July 14			31	0.02	July 14	1232	73
July 7	July 14	< 0.05	$.12 \times 10^{-12}$					
July 14	July 21	< 0.05	$.128 \times 10^{-12}$	143	0.29	July 21	1346	176
July 21	July 28	< 0.05	$.303 \times 10^{-12}$	122	0.02	July 28	1318	188
July 28	Aug. 4	< 0.05	$.036 \times 10^{-12}$	111	0.55	Aug. 4	1350	126
Aug. 4	Aug. 11	< 0.05	$.072 \times 10^{-12}$	94	0.32	Aug. 11	1300	149
Aug. 11	Aug. 14			74		Aug. 14	1348	68
Aug. 14	Aug. 18			81	1.67	Aug. 18	1608	277
Aug. 11	Aug. 18	< 0.05	$< .08 \times 10^{-12}$					
Aug. 18	Aug. 21			52	0.08	Aug. 22	1205	307
Aug. 21	Aug. 22			107	1.35	Aug. 23	1617	1632
Aug. 22	Aug. 23			2	trace	Aug. 25	1149	32
Aug. 23	Aug. 25			56	0.96	Aug. 28	1527	61
Aug. 18	Aug. 25	< 0.05	0					
Aug. 25	Sept. 1	<0.05	$.056 \times 10^{-12}$	12	0.96	Sept. 1	1143	25

THIRD QUARTER 1961

Collection Date Start	Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Time of count	Beta activity μμc/M²
Sept. 1	Sept. 5	0.03	$.062 \times 10^{-12}$	89	0.32	Sept. 5	1431	211
Sept. 5	Sept. 6	<0.05	0	8	0.0	Sept. 6	1305	37
Sept. 6	Sept. 7	<0.05	0	15	0.0	Sept. 7	1257	26
Sept. 7	Sept. 8	<0.05	$.022 \times 10^{-12}$	14	0.0	Sept. 8	1223	25
Sept. 8	Sept. 11	<0.05	$.47 \times 10^{-12}$	163	0.34	Sept. 11	1355	291
Sept. 11	Sept. 12	0.03	$.626 \times 10^{-12}$	51	0.08	Sept. 12	1300	103
Sept. 12	Sept. 13	0.04	2.05×10^{-12}	37	0.0	Sept. 13	1144	47
Sept. 13	Sept. 14	0.03	2.99×10^{-12}	66	0.0	Sept. 14	1124	107
Sept. 14	Sept. 15	<0.03	1.55×10^{-12}	23	0.07	Sept. 15	1226	61
Sept. 15	Sept. 18	0.04	5.42×10^{-12}	176	0.18	Sept. 18	1213	296
Sept. 18	Sept. 19	0.03	lost sample	337	0.19	Sept. 19	1405	477
Sept. 19	Sept. 20	0.05	3.14×10^{-12}	535	0.09	Sept. 20	1304	877
Sept. 20	Sept. 21	<0.03	8.16×10^{-12}	510	0.0	Sept. 21	1233	872
Sept. 21	Sept. 22	0.03	2.36×10^{-12}	52	0.0	Sept. 22	1221	75
Sept. 22	Sept. 25	0.03	14.42×10^{-12}	59	trace	Sept. 25	1357	91
Sept. 25	Sept. 26	<0.05	6.37×10^{-12}	97	0.0	Sept. 26	1208	139
Sept. 26	Sept. 27	0.03	7.06×10^{-12}	166	0.0	Sept. 27	1604	283
Sept. 27	Sept. 28	0.04	3.87×10^{-12}	32	0.0	Sept. 28	1156	93
Sept. 28	Sept. 29	<0.05	1.63×10^{-12}	32	0.0	Sept. 29	1220	93

FOURTH QUARTER 1961

Collection Date Start	Collection Date Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Beta activity counted 7 days after collection: Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Early count - Rain gauge: Time of count	Early count - Rain gauge: Beta activity μμc/M²
Sept. 29	Oct. 2		30.78×10^{-12}	2271	0	Oct. 2	1150	3535
Oct. 2	Oct. 3		10.11×10^{-12}	325	0	Oct. 3	1317	487
Oct. 3	Oct. 4	0.04	7.34×10^{-12}	83	0	Oct. 4	1404	180
Oct. 4	Oct. 5	0.04	4.19×10^{-12}	90	0	Oct. 5	1245	160
Oct. 5	Oct. 6	<0.03	4.05×10^{-12}	89	0	Oct. 6	1249	125
Oct. 6	Oct. 9	<0.03	7.29×10^{-12}	1124	0.29	Oct. 10	0925	2328
Oct. 9	Oct. 10	0.04	4.47×10^{-12}	807	0.51	Oct. 11	1112	947
Oct. 10	Oct. 11	0.03	3.94×10^{-12}	630	0	Oct. 11	1214	872
Oct. 11	Oct. 12		2.37×10^{-12}	59	0	Oct. 12	1451	125
Oct. 12	Oct. 13		2.99×10^{-12}	45	0	Oct. 13	1303	78
Oct. 13	Oct. 16	0.04	8.56×10^{-12}	77	0	Oct. 16	1141	120
Oct. 16	Oct. 17	<0.05	1.86×10^{-12}	57	0	Oct. 17	1232	75
Oct. 17	Oct. 18	<0.03	2.48×10^{-12}	49	0	Oct. 18	1141	80
Oct. 18	Oct. 19	<0.03	2.26×10^{-12}	5	0	Oct. 19	1422	33
Oct. 19	Oct. 20		5.27×10^{-12}	29	0	Oct. 20	1223	44
Oct. 20	Oct. 23	<0.04	21.29×10^{-12}	118	trace	Oct. 23	1343	290
Oct. 23	Oct. 24	0.04	12.27×10^{-12}	48	0	Oct. 24	1240	81
Oct. 24	Oct. 25	<0.04	9.75×10^{-12}	36	0	Oct. 25	1158	92
Oct. 25	Oct. 26	0.04	7.21×10^{-12}	186	0	Oct. 26	1149	397
Oct. 26	Oct. 27	<0.05	4.44×10^{-12}	190	trace	Oct. 27	1208	329
Oct. 27	Oct. 30	0.04	13.12×10^{-12}	15,794	0.63	Oct. 30	1529	25,695
Oct. 30	Oct. 31	0.05	1.51×10^{-12}	6,675	0.35	Oct. 31	1520	10,331

FOURTH QUARTER 1961

Collection Date Start	Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Rain gauge μμc/M²	Precipitation (inches)	Early count - Rain gauge: Date of count	Time of count	Beta activity μμc/M²
Oct. 31	Nov. 1	<0.05	2.04×10^{-12}	1830	0.34	Nov. 1	1411	2269
Nov. 1	Nov. 2	0.04	10.78×10^{-12}	1950	0.07	Nov. 2	1225	2126
Nov. 2	Nov. 3	<0.05	18.03×10^{-12}	1876	0.01	Nov. 3	1153	3330
Nov. 3	Nov. 6	0.03	17.93×10^{-12}	2078	0.01	Nov. 6	1310	2725
Nov. 6	Nov. 7	0.04	6.21×10^{-12}	180	0	Nov. 7	1316	279
Nov. 7	Nov. 8	0.04	8.55×10^{-12}	344	0	Nov. 8	1143	504
Nov. 8	Nov. 9	<0.05	1.36×10^{-12}	1038	0.25	Nov. 9	1222	1477
Nov. 9	Nov. 13	0.05	18.30×10^{-12}	7626	0.18	Nov. 13	1250	10,732
Nov. 13	Nov. 14	0.04	6.84×10^{-12}	1303	0.01	Nov. 14	1259	2088
Nov. 14	Nov. 15	0.04	3.37×10^{-12}	4668	0.18	Nov. 15	1157	6954
Nov. 15	Nov. 16	0.03	6.04×10^{-12}	899	trace	Nov. 16	1240	1118
Nov. 16	Nov. 17	0.05	5.81×10^{-12}	2403	trace	Nov. 17	1142	3824
Nov. 17	Nov. 20	0.04	38.63×10^{-12}	2225	0.01	Nov. 20	1148	2754
Nov. 20	Nov. 21	0.04	11.99×10^{-12}	2746	0.03	Nov. 21	1202	3262
Nov. 21	Nov. 22	0.04	2.19×10^{-12}	1076	trace	Nov. 22	1142	1616
Nov. 22	Nov. 24	0.05	8.68×10^{-12}	422	0	Nov. 24	1147	498
Nov. 24	Nov. 27	0.05	20.75×10^{-12}	1499	0.02	Nov. 27	1143	1941
Nov. 27	Nov. 28	0.04	8.23×10^{-12}	344	0	Nov. 28	1132	404
Nov. 28	Nov. 29		14.28×10^{-12}	358	0	Nov. 29	1203	399
Nov. 29	Nov. 30	0.04	8.47×10^{-12}	1534	0.04	Nov. 30	1328	2000

FOURTH QUARTER 1961

Collection Date Start	Stop	Gamma mr/hr 3 ft above roof	Beta activity counted 7 days after collection: Airborne μc/cc	Rain gauge μμc/M^2	Precipitation (inches)	Early count - Rain gauge: Date of count	Time of count	Beta activity μμc/M^2
Nov. 30	Dec. 1	< 0.05	4.29×10^{-12}	179	0	Dec. 1	1138	245
Dec. 1	Dec. 4	0.04	9.82×10^{-12}	189	trace	Dec. 4	1120	248
Dec. 4	Dec. 5	< 0.05	10.57×10^{-12}	407	0	Dec. 5	1247	406
Dec. 5	Dec. 6	< 0.05	7.00×10^{-12}	122	0	Dec. 6	1207	174
Dec. 6	Dec. 7	0.04	4.68×10^{-12}	108	trace	Dec. 7	1119	159
Dec. 7	Dec. 8	< 0.05	7.70×10^{-12}	301	0	Dec. 8	1238	306
Dec. 8	Dec. 11	0.05	27.61×10^{-12}	17,836	1.25	Dec. 11	1210	22,295
Dec. 11	Dec. 12	0.04	14.53×10^{-12}	285	0	Dec. 12	1127	488
Dec. 12	Dec. 13	0.04	10.79×10^{-12}	349	0	Dec. 13	1114	432
Dec. 13	Dec. 14	0.04	14.76×10^{-12}	773	0.04	Dec. 14	1125	948
Dec. 14	Dec. 15	< 0.05	7.43×10^{-12}	2483	0.06	Dec. 15	1227	3056
Dec. 15	Dec. 18	0.04	8.24×10^{-12}	7999	1.29	Dec. 18	1506	10,217
Dec. 18	Dec. 19	0.04	12.77×10^{-12}	1500	trace	Dec. 19	1208	1723
Dec. 19	Dec. 20	0.03	8.84×10^{-12}	679	0	Dec. 20	1118	792
Dec. 20	Dec. 21	0.03	4.51×10^{-12}	257	0	Dec. 21	1140	353
Dec. 21	Dec. 22	< 0.05	5.16×10^{-12}	281	0	Dec. 22	1206	363
Dec. 22	Dec. 26		42.51×10^{-12}	262	0	Dec. 26	1150	311
Dec. 26	Dec. 27	0.04	7.14×10^{-12}	277	0	Dec. 27	1134	382
Dec. 27	Dec. 28	0.04	14.38×10^{-12}	338	0	Dec. 28	1210	432
Dec. 28	Dec. 29	< 0.05	12.58×10^{-12}	868	0	Dec. 29	1231	1097

TABLE I

SUMMARY 1961

Precipitation		20.18 in.
Air Samples	$\bar{X}$/sample	3.32×10^{-12} μc/cc
12-22/12-26	Maximum	42.51×10^{-12} "
1-16/1-17	Minimum	0
Water Samples	Total	108,357 μμc/M^2
	$\bar{X}$/day	301 "
12-8/12-11	Maximum	17,836 "
2-8/2-10	Minimum	0

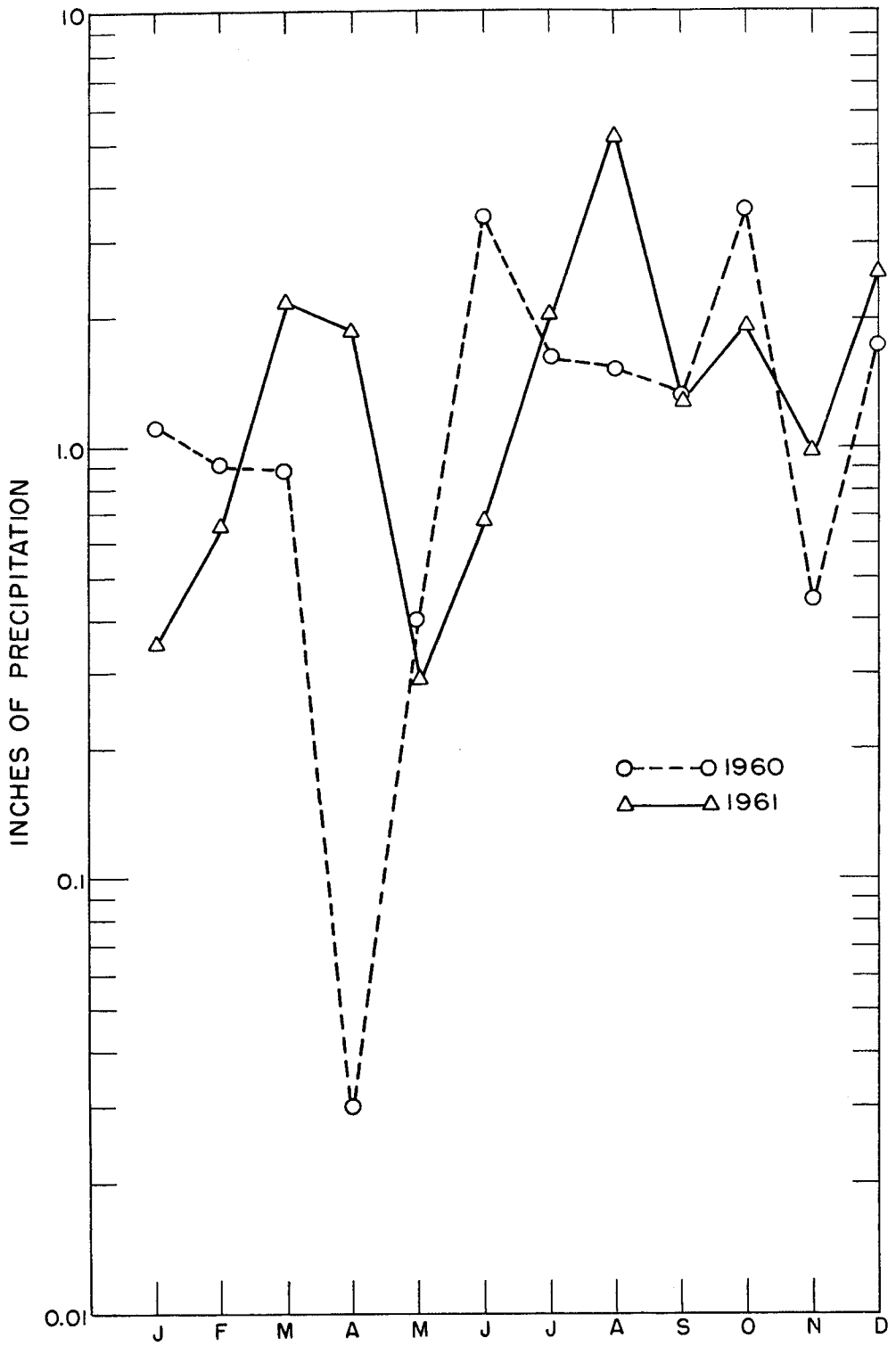

Fig. 1 Total Monthly Precipitation

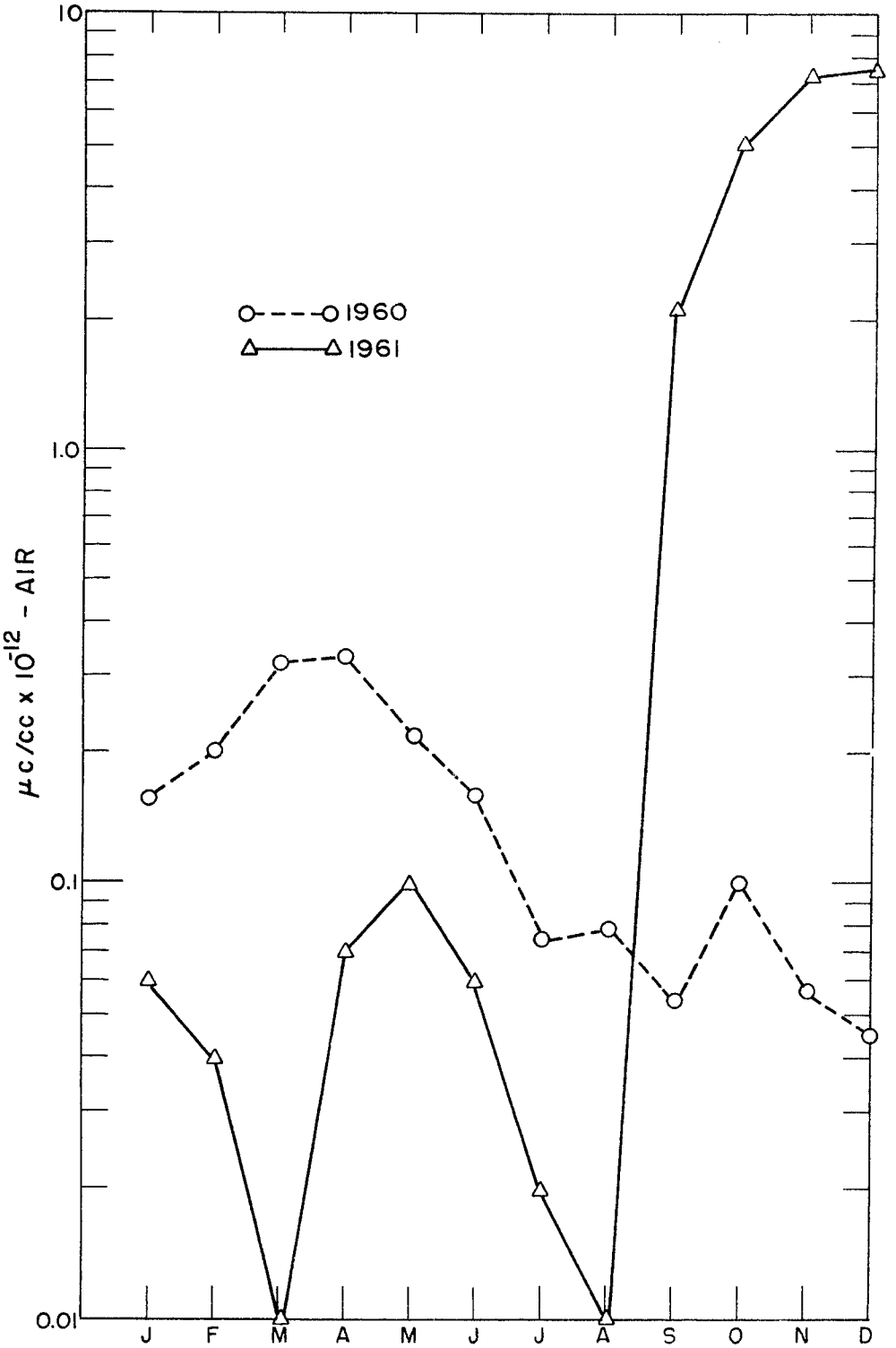

Fig. 2 Average "Per Day" Activity Found in Air Filter Samples

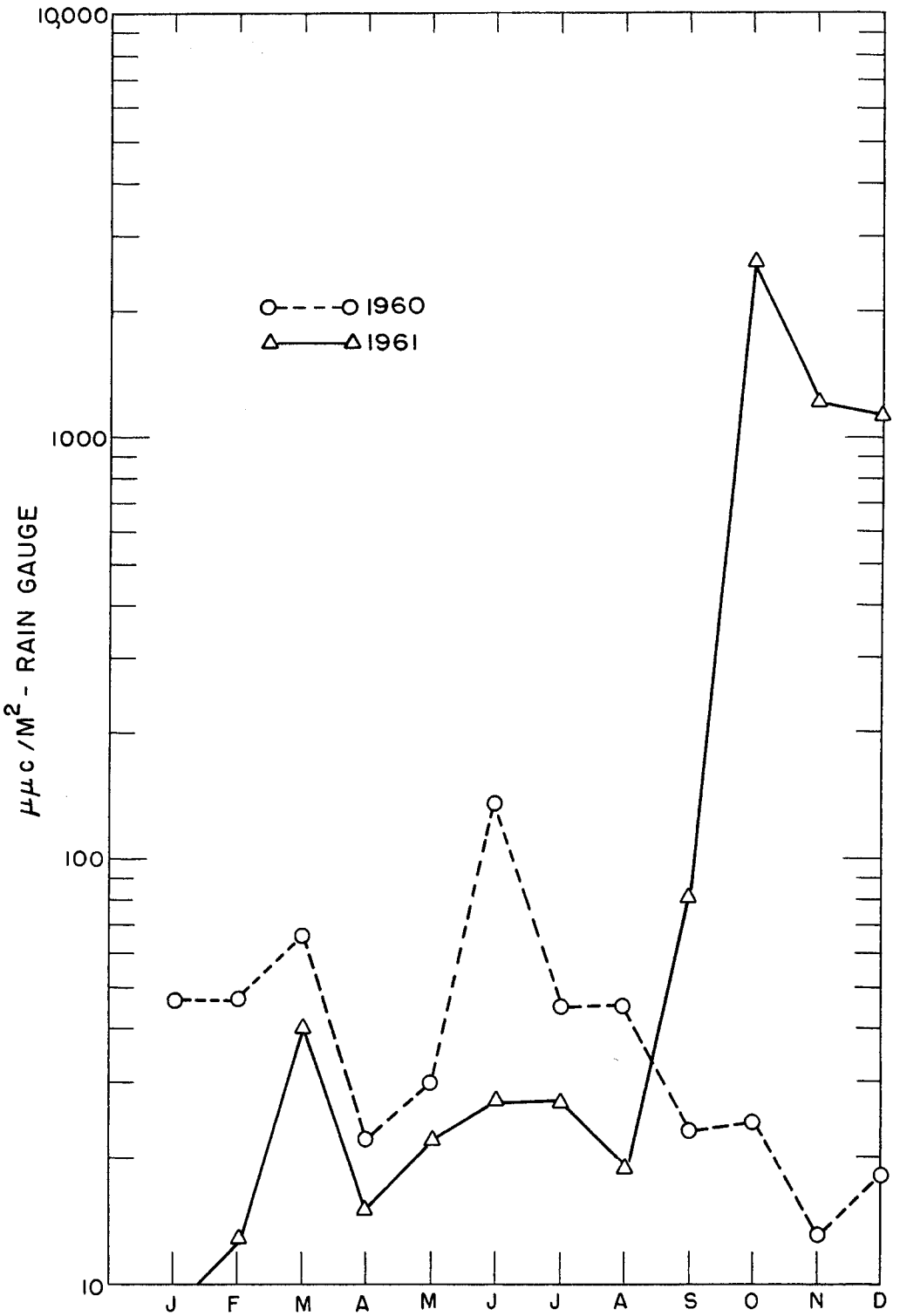

Fig. 3 Average "Per Day" Activities Found in Water Gauge Samples