OPTIONAL FORM NO. 10

UNITED STATES GOVERNMENT

Memorandum

410339

TO : A. W. Klement, Fallout Studies Branch
Division of Biology and Medicine

DATE: February 23, 1960

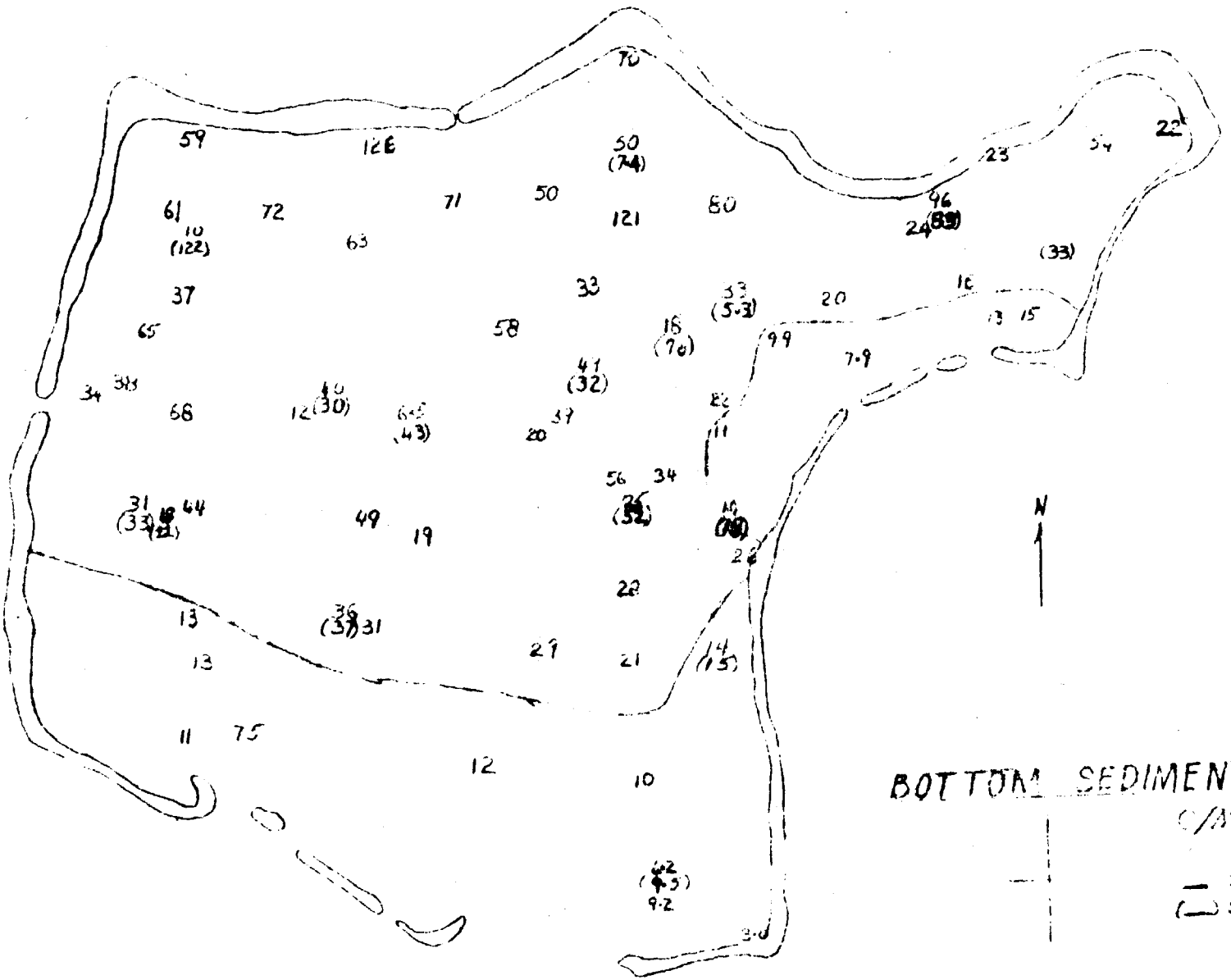
FROM : I. E. Wallen, Aquatic Biologist, Environmental Sciences Branch, Division of Biology & Medicine

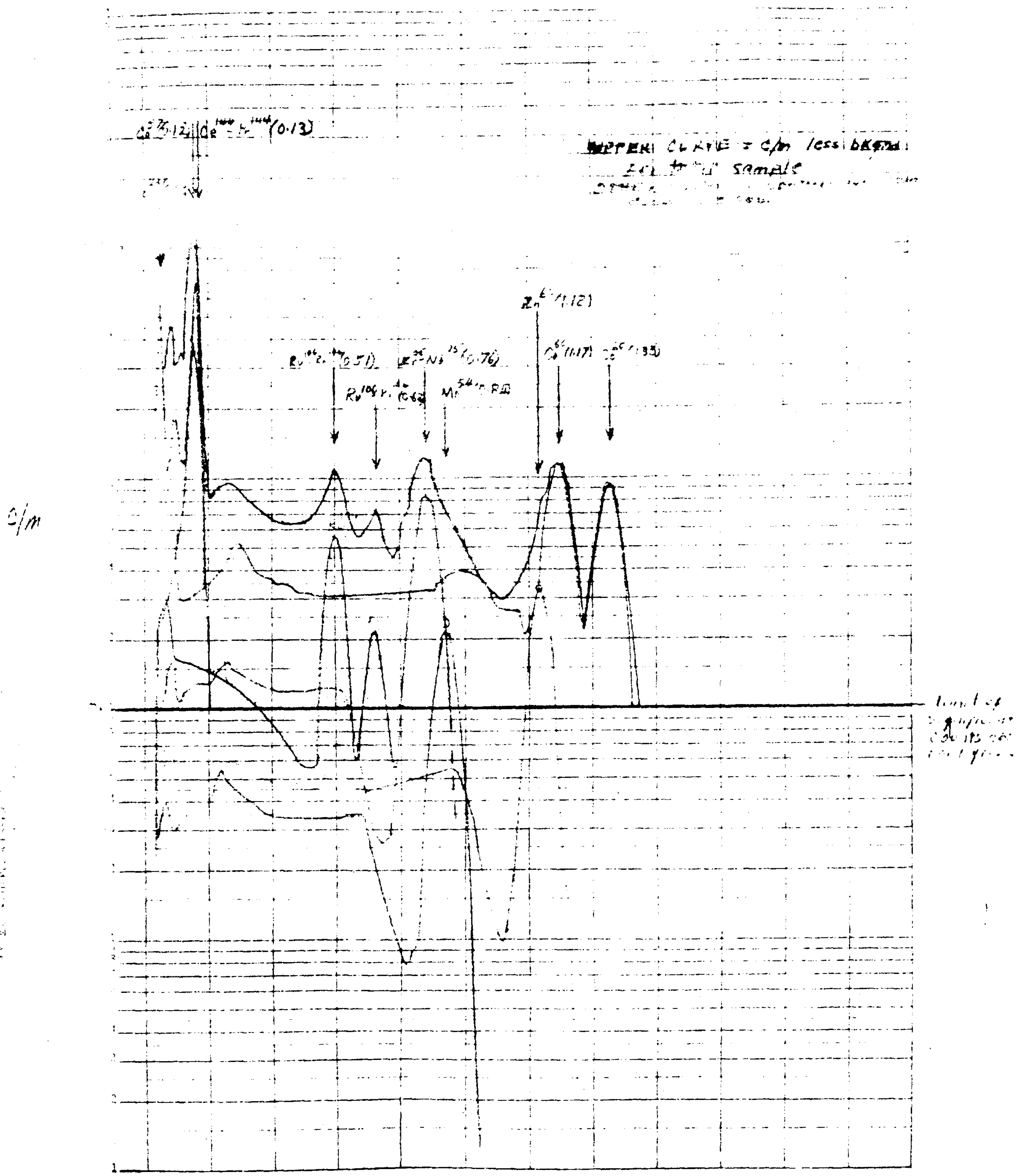
SUBJECT: RONGELAP DATA

SYMBOL: BMES:IEW

Recently Allyn Seymour of the University of Washington brought in the attached data which represents preliminary results of the Rongelap Survey of last September. The attached copy is for your Rongelap notebook.

Attachment:
As stated above





Ce144-Pr144 (0.13)
Zn65 (1.12)
Co60 (1.17)
Mn54
sample
C/m

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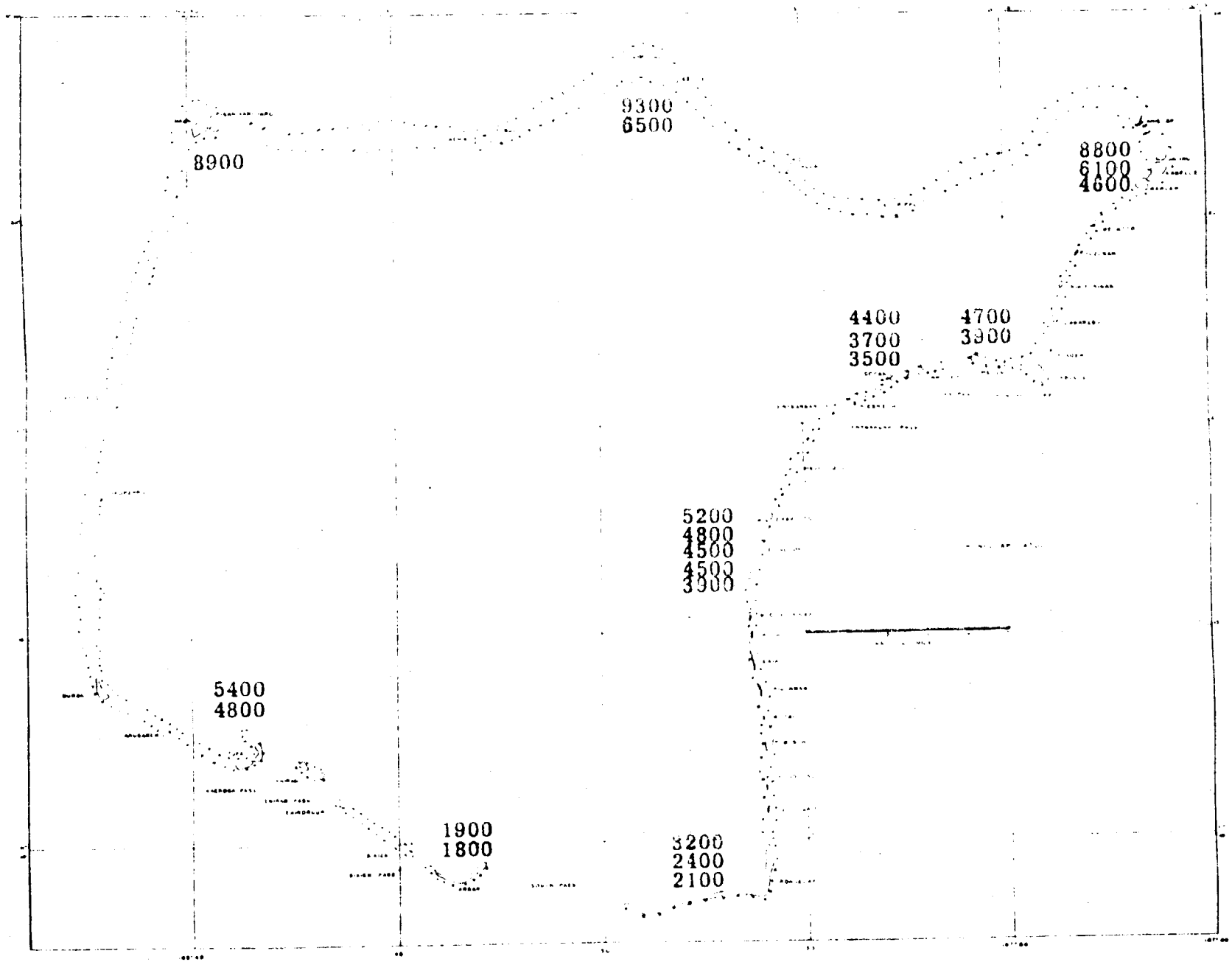

Strontium units in Birgus latro (coconut crab) skeleton at Rongelap Atoll, September, 1959

Strontium-90 in Birgus latro (coconut crab) skeleton
Collected at Rongelap Atoll September 1959
Mean Values

Island	Sample numbers	Sr^{90} Mean d/m/g dry	Standard deviation	Mean strontium units	Standard deviation
Rongelap	554, 553, 552	1440	216	2570	586
Rinnetok	556, 559, 557 558, 555	2570	334	4580	151
Gogon	650, 651, 663	2120	282	3870	468
Aellu	659, 652	2490	267	4300	566
Ribelle	649, 648, 653	3500	1044	6500	2128
Gejen	655, 656	4530	1011	7900	1980
Naen	661	5250	--	8900	--
Tufa	660, 662	3090	117	5100	424
Arbar	657, 654	1070	14	1850	71

Note: The counting error (95%) ranges from 3.6 to 4%.

Sr^{90} in Birgus latro (Coconut Crab) Skeleton

Collected at Rongelap Atoll September 1959

Individual Values

Island	Sample Number	Sr^{90} d/m/g dry	Ca mg/g dry	Strontium Units
Rongelap	552	1250	275.1	2100
	553	1380	267.3	2400
	554	1670	238.6	3200
Eniaetok	555	2140	251.0	3900
	556	3030	262.8	5200
	557	2390	239.9	4500
	558	2600	264.1	4500
	559	2710	256.2	4800
Bogon	650	2430	253.0	4400
	651	1870	228.2	3700
	663	2080	268.9	3500
Mellu	652	2300	265.5	3900
	659	2680	258.8	4700
Kabelle	648	3100	230.2	6100
	649	4690	243.2	8800
	653	2720	267.5	4600
Gejen	655	5240	257.5	9300
	656	3830	267.5	6500
Naen	661	5250	267.5	8900
Tufa	660	3180	208.9	5400
	662	3010	284.3	4800
Arbar	654	1060	264.2	1800
	657	1080	264.2	1900

Note: Counting error (95%) ranges from 3.6 to 4%.

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Gross Beta Activity in Land Plants - Rongelap Atoll

Rongelap Island

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Aug. 1958	Artocarpus	Leaves	1	538.5	.104
"	"	Fruit	1	136.3	.013
Mar. 1958	Boerhaavia	Leaves	1	518	.039
Aug. 1958	"	"	1	1468.9	.100
Aug. 1958	Canavalia	Leaves	1	325.8	.032
Aug. 1958	Carica	Pulp	1	152.4	.005
Mar. 1959	"	"	4	215	.007
Aug. 1958	"	Seeds and skin	1	289.8	.018
March 1959	"	"	4	390.6	.024
Mar. 1958	Cassytha	Whole plant	2	155	.014
Aug. 1958	"	"	3	503.2	.040

Rongelap Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1958	Cocos	Leaves	3	197.6	.028
Aug. 1958	"	"	4	653.4	.143
Mar. 1958	"	Trunk borings	3	30	.005
Aug. 1958	"	"	2	22.6	.004
Mar. 1958	"	Husks	1	36	.012
Aug. 1958	"	"	4	28.4	.010
Mar. 1958	"	Meat	8	57.6	.023
Aug. 1958	"	"	4	40.9	.012
Mar. 1958	"	Milk	2	192	.005
Aug. 1958	"	"	2	525.6	.011
Aug. 1958	Cucurbita	Leaves	2	1588	.032 *

* Includes samples of terminal and basal foliage. See tables of individual collections.

Rongelap Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1958	Fimbristylis	Leaves	3	118	.018
Aug. 1958	"	"	4	446.3	.076
Mar. 1959	"	"	3	480.6	.071
Mar. 1958	Guettarda	Leaves	4	190.05	.022
Aug. 1958	"	"	5	411.7	.049
Aug. 1958	"	Fruit	1	107.1	.020
Mar. 1958	Ipomoea	Leaves	1	287	.016
Aug. 1958	"	"	1	521.7	.055
Mar. 1958	Lepturus	Leaves	2	160	.030
Aug. 1958	"	"	2	864.2	.194
Mar. 1959	"	"	1	195.5	.044
Mar. 1959	Messerschmidea	Leaves	5	380.4	.029*

* Includes samples of terminal and basal foliage. See tables of individual collections.

Rongelap Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1953	Pandanus	Leaves	4	197.2	.026
Aug. 58	"	"	4	495.7	.073
Mar. 1959	"	"	5	328.9	.049
Mar. 1953	"	Fruit, edible	1	666	.060
Aug. 1958	"	" "	1	110.9	.008
Mar. 1959	"	" "	5	345.0	.030
Mar. 1953	Pandanus	Trunk borings	1	125	.011
Aug. 1958	"	"	1	174.8	.015
Mar. 1959	"	Stem	2	172.5	
Aug. 1958	Pemphis	Leaves	1	81.37	.015
Mar. 1953	Roots	Roots	6	46.5	.007
Aug. 1958	"	"	6	109	.025

Rongelap Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1958	Scaevola	Leaves	4	234.2	.010
Aug. 1958	"	"	5	225.5	.017
Mar. 1959	"	"	7	383.4	.034 *
Mar. 1958	Tacca	Leaves	1	260	.022
Aug. 1958	"	"	1	343.8	.020
Mar. 1958	"	Corm, Peel	1	154	.008
Aug. 1958	"	" "	1	216.5	.016
Mar. 1958	"	Corm, whole	1	80	.059
Aug. 1958	"	" "	1	247.1	.017
Mar. 1959	"	" "	5	230	.015
Mar. 1958	Triumfetta	Leaves	1	650	.056
Aug. 1958	"	"	2	958.6	.080

* Includes samples of terminal and basal foliage. See tables of individual collections.

Eniaetok Island

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Aug. 1958	Canavalia	Leaves	1	1195	.091
Mar. 1958	Cassytha	Whole plant	1	358	.038
Aug. 1958	"	"	2	268.9	.025
Mar. 1958	Cocos	Meat	1	214	.020
Aug. 1958	"	"	4	76.24	.019
Mar. 1958	Cocos	Milk	1	158	.002
Aug. 1958	Cocos	Leaves	2	441.4	.087
Mar. 1958	Cucurbita	Meat	1	353	.025
Mar. 1958	Cucurbita	Pulp, seeds	1	1649	.025

Eniaetok Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1958	Cucurbita	Skin	1	448	.030
Mar. 1958	Fimbristylis	Leaves	1	332	.067
Aug. 1958	"	"	1	142.4	.028
Mar. 1958	Ipomoea	Leaves	2	579	.035
Aug. 1958	"	"	2	285.4	.016
Mar. 1958	Messerschmidea	Leaves	1	612	.042
Mar. 1958	Morinda	Fruit	1	199	.015
Mar. 1958	Morinda	Leaves	2	447	.033
Aug. 1958	"	"	2	862.2	.074
March 1958	Pandanus	Fruit	2	258	.035
Aug. 1958	"	"	1	77.4	.008

Eniaetok Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1958	Pandanus	Leaves	2	224	.030
Aug. 1958	"	"	2	370.1	.062
Aug. 1958	Portulaca	Leaves	1	208.3	.009
Mar. 1958	Roots	Roots	2	137	.015
Mar. 1958	Scaevola	Leaves	2	116	.011
Aug. 1958	"	"	5	552.6	.044 *
Mar. 1958	Tacca	Corm, whole	1	595	.059
Aug. 1958	"	" "	2	151.9	.007
Mar. 1958	Tacca	Corm, peel	1	378	.030
Aug. 1958	"	" "	2	194.4	.009

*Includes samples of terminal and basal foliage. See tables of individual collections.

Eniaetok Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. µc/kg wet
Mar. 1958	Tacca	Corm, center	1	176	.022
Aug. 1958	"	" "	2	222.7	.008
Aug. 1958	Tacca	Leaves	2	611.9	.043
Mar. 1958	Triumfetta	Leaves	2	562	.052
Aug. 1958	"	"	2	443.6	.036

Kabelle Island

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. µc/kg wet
Mar. 1958	Boerhaavia	Leaves	6	1434	.100
Aug. 1958	"	"	7	1319	.133
Mar. 1958	Cocos	Leaves	3	401.6	.049
Aug. 1958	"	"	3	1926	.458
Mar. 1958	"	Husk	2	50	.017
Aug. 1958	"	"	4	229.5	.076
Mar. 1958	"	Meat	2	128.5	.015
Aug. 1958	"	"	4	96.22	.034
Mar. 1958	"	Milk	2	975	.022
Aug. 1958	"	"	2	873.5	.018
Mar. 1958	Fimbristylis	Leaves	1	196	.035
Aug. 1958	"	"	1	597.4	.090

Kabelle Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1958	Guettarda	Leaves	3	369	.043
Aug. 1958	"	"	3	3102	.252
Mar. 1958	Lepturus	Leaves	4	1278	.119
Aug. 1958	"	"	3	1494	.362
Mar. 1958	Messerschmidea	Leaves	3	703	.049
Aug. 1958	"	"	5	838.2	.180
Mar. 1959	"	"	6	1912	.148*
Mar. 1958	Morinda	Fruit	1	660	.052
Aug. 1958	"	"	1	518.5	.038
Mar. 1958	"	Leaves	2	690	.055
Aug. 1958	"	"	1	1309.2	.105
Mar. 1958	Pandanus	Fruit	1	246	.040
Aug. 1958	"	"	1	228.6	.021

*Includes samples of terminal and basal foliage. See tables of individual collections.

Kabelle Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. μc/kg wet
Mar. 1958	Pisonia	Leaves	3	1153	.097
Aug. 1958	"	"	4	4034	.437
Mar. 1958	"	Trunk borings	2	188	.028
Aug. 1958	"	"	1	220.2	.066
Mar. 1958	Portulaca	Leaves	2	2762	.146
Aug. 1958	"	"	1	2929	.137
Mar. 1958	Roots	Roots	5	3431	.309
Aug. 1958	"	"	2	1987	.310
Mar. 1958	Scaevola	Leaves	7	380.3	.035
Aug. 1958	"	"	11	2270	.022*
Mar. 1959	"	"	7	1131	.088*
Mar. 1958	Sida	Leaves	1	1077	.123
Aug. 1958	"	"	1	2292.8	.817

*Includes samples of terminal and basal foliage. See tables of individual collections.

Kabelle Island - (cont.)

Date collected	Genus	Tissue	No. of samples	Ave. d/m/g dry	Ave. µc/kg wet
Aug. 1958	Tacca	Leaves	1	475.2	.037
Aug. 1958	Tacca	Corm, whole	1	952	.051
Aug. 1958	Tacca	Corm, peel	1	713.4	.048
Mar. 1958	Triumfetta	Leaves	4	472.5	.037
Aug. 1958	"	"	3	1123	.128

Cesium-137 and Total Potassium in Pandanus collected at Rongelap Island during March, 1959.

		Cs^{137} d/m/g dried	Cs^{137} μμc/g dried	K mg/g dried	'Cesium units' μμc Cs^{137} gram K
Old bark	#2	22	10	0.30	13000
New bark	#2	30	14	5.8	2400
	#3	42	19	4.3	4500
	#4	38	17	4.3	4100
Green stem	#2	33	38	6.0	6200
	#4	59	27	10.2	2600

Summary Table. Cs^{137} in Pandanus Fruit

Island	Date collected	Number samples	Cs^{137} per gram wet sample	Kmg/g wet	Cesium units $\mu\mu c\ Cs^{137}$ / gram K
Rongelap	Jan. 1955	1	215		
Rongelap	Oct. 1955	1	112		
Rongelap (seed end)	July, 1956	1	56		
Rongelap	July 1957	1	168		
Rongelap	March 1958	1	154	3.6	14000
Rongelap	Aug. 1958	1	31	1.4	10000
Rongelap	Mar. 1959	5	42±27*	2.4±1.5*	13000±12500*
Kabelle	Mar. 1958	1	266	5.2	23000
Kabelle	Aug. 1958	1	81	0.3	40000
Eniaetok	Mar. 1958	2	172±38*	5.6±1.4*	16500±11500*
Eniaetok	Aug. 1958	1	65	2.3	13000

*Standard Deviation

Cesium-137 in the Jan. 1955 sample was determined by a standard chemical method; cesium-137 in the Oct. 1955 and July 1958 samples by analysis of gamma spectra of the dried filtrate from $Sr(NO_3)_2$ precipitation; and cesium-137 in the remaining samples by analysis of gamma spectra of dried unashed sample.

Cesium-137 and Total Potassium in Pandanus collected at Rongelap Island during March, 1959.

		Cs^{137} d/m/g dried	Cs^{137} μμc/g wet	K mg/g dried	Cesium units μμc Cs^{137} gram K
Fruit (edible portion)	#1	424	38	5.2	37000
	#2	223	20	27.2	3700
	#3	99	8.6	9.7	4600
	#4	74	6.3	11.5	2900
	#5	266	24.	7.1	17000
	Ave.	217	19	12.2	13000
Fruit (inedible portion)	#1	234	25	7.3	17000
	#2	79	6.8	9.2	3900
	#3	126	11	13.6	4200
	#4	65	5.9	14.0	2100
	#5	174	15.	8.4	9400
	Ave.	146	13	10.6	7300
Leaves	#1	80	12	0.90	40000
	#2	67	10	6.2	4900
	#3	46	6.8	4.2	5000
	#4	35	5.5	10.5	1500
	#5	10	1.5	1.6	2840
	Ave.	48	10	4.7	11000
Leaves, seedlings		343	52	3.7	42000

Sr^{90} in Pandanus Fruit - Summary Table

Island	Date collected	Number samples	Sr^{90} d/m per gram wet sample	Ca mg/g wet	Strontium units	Limit of detectability d/m/g wet
Rongelap	Jan. 1955	1	2.4			0.11
Rongelap	Oct. 1955	1	3.8			0.11
Rongelap (see end)	July 1956	1	2.2	4.5	150	0.15
Rongelap	July 1957	1	1.7	0.74	1056	0.8
Rongelap	March 1958	1	0	2.44	0	0.5
Rongelap	Aug. 1958	1	0.74	0.66	512	0.25
Rongelap	March 1959	3	3.7±2.6*	1.04±.46	1478±4.90*	0.25
Kabelle	March 1958	1	0	2.96	0	0.5
	Aug. 1958	1	2.30	0.83	1538	0.25
Eniaetok	March 1958	2	0	3.67	0	0.5
	Aug. 1958	1	1.02	1.15	1502	0.25

*Standard deviation

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Strontium-90 and Total Calcium in Pandanus collected at Rongelap Island during March, 1959

		Sr^{90} d/m/g dried	Sr^{90} μμc/g wet	Ca mg/g dried	Strontium units
Fruit edible portion	#1	6.8±0.8	0.8±0.5	3.16±0.28	978
	#2	37.6±2.0	3.4±0.2	9.00±0.03	1899
	#3	31.5±2.0	2.8±0.2	7.35±0.04	1966
	#4	7.5±0.8	0.6±0.1	4.13±0	798
	#5	11.5±0.8	1.0±0.5	2.99±0.08	1749
	Ave.	19.0	1.7	5.33	1478
Fruit inedible portion	#1	11.3±0.7	1.0±0.05	2.84±0.12	1810
	#2	10.3±0.7	0.9±0.05	1.91±0.02	2450
	#3	13.0±0.8	1.3±0.1	4.09±0.14	1545
	#4	6.0±0.5	0.5±0.05	4.13±0.07	656
	#5	11.6±0.4	1.0±0.04	2.38±0.04	2214
	Ave.	10.6	0.9	3.70	1735
Leaves	#1	27.9±1.7	4.2±0.3	7.71±0.05	1645
	#2	31.9±1.9	4.8±0.3	12.04±0	1204
	#3	64.2±3.3	9.7±0.5	20.91±0.04	1396
	#4	91.3±7.0	13.8±1.0	15.20±0.11	2736
	#5	2.8±0.8	0.42±0.10	17.48±0.05	73
	Ave.	43.7	6.6	14.66	1411
Leaves, seedlings		78.8±4.8	11.9±0.7	11.31±0	3187

Errors given for radioactivity values are obtained from counting error.

Errors given for total calcium values are obtained from standard deviations of replicate analyses.

		Sr^{90} d/m/g dried	Sr^{90} μμc/g wet	Ca mg/g dried	Strontium units
Green Stem	#2	67.6± 3.4	30.7±1.5	18.92±0	1816
	#4	8.3± 0.3	3.8±0.2	6.28±0.08	600
Old bark	#2	14.1± 0.3	6.4±0.4	4.59±0.22	1397
New bark	#2	16.2± 3.2	7.4±1.5	6.53±0	1129
	#3	9.9± 2.0	4.5±0.9	3.64±0.25	1236
	#4	226. ±12.	103. ±5	3.49±0.16	29383

Wet weight values for these samples are not available.

Errors given for radioactivity values are obtained from counting error.

Errors given for total calcium values are obtained from standard deviations for replicate samples.

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Strontium-90 and Total Calcium in Tacca Collected at Rongelap Atoll.

Summary Table

Island	Tissue	Date collected	Number samples	Sr^{90} d/m/g wet	Ca mg/g wet	"Strontium units"	Limit of detectability d/m/g wet
Labaredj	whole corms	Oct. 1955	1	1.2			0.10
Rongelap	whole corms	July 1956	1	2.5	3.3	340	0.08
		July 1957	1	0.5	0.75	306	0.13
		March 1958	1	1.12	0.19	2600	0.19
		Aug. 1958	1	7.91	1.00	3600	0.62
	centers	Mar. 1958	1	$0.445 \pm .015$ (3)	$0.166 \pm .007$ (3)	1210 ± 10 (3)	0.17
		Aug. 1958	1	2.73	0.21	6000	0.41
		Mar. 1959	5	0.36 ± 0.15 (1)	$0.067 \pm .015$ (1)	2400 ± 700 (1)	0.09
	peels	Mar. 1958	1	1.02	0.42	1100	0.92
		Aug. 1958	1	18.53	1.46	5800	1.58
Kabelle	whole corms	Mar. 1958	1	3.85	0.48	3600	0.37
		Aug. 1958	1	12.94	1.87	3200	0.63
	centers	Mar. 1958	1	1.1	1.37 ± 0.37 (3)	490	0.36
		Aug. 1958	1	(2)	0.67	(2)	
	peels	Mar. 1958	1	6.18	0.66	4300	1.05
		Aug. 1958	1	12.34	1.68	7400	4.58
Eniaetok	whole corms	Mar. 1958	1	1.50	2.0	350	0.36
		Aug. 1958	2	8.33 ± 1.16 (1)	1.45 ± 0.12 (1)	2600 ± 590	0.50
R122	centers	Mar. 1958	1	0.38 ± 0.13 (3)	0.31 ± 0.21 (3)	1340 ± 1170 (3)	0.3(4)
		Aug. 1958	2	4.32 ± 0.21 (1)	0.87 ± 0.02 (1)	2300 ± 53	0.75
	peels	Mar. 1958	1	3.9 ± 0.4 (1)	$0.92 \pm .03$ (3)	2000	0.7
		Aug. 1958	2	8.14 ± 0.15 (1)	1.50 ± 0.08 (1)	2500 ± 86	0.64

(1) Standard deviation
(2) Not yet done; results will be available later
(3) Averages of separated determinations made at different times, errors given are standard deviations.
(4) The large difference between two strontium unit values is due to widely differing calcium values. The determination of calcium in this sample is being rechecked.

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Strontium-90 and Total Calcium in Taeca
Collected at Rongelap Atoll

			Date of analysis	Sr^{90}(1) d/m/g dried	Sr^{90}(1) μμc/g wet	Ca mg/g dried	Strontium units
March 1958							
Stems	R 10a	Rongelap	Jan. 60	7.0±1.0	0.31±0.61	1.2	2600
	R 93a	Kabelle	Jan. 60	11 ±1	1.75±0.17	1.4	3600
	R122a	Eniaetok	Jan. 60	6.9±1.3	0.68±0.13	9.1	350
Peels	R 10b	Rongelap	Jan. 60	11 ±3	0.46±0.24	4.3	1100
	R 93b	Kabelle	Jan. 60	67 ±9	2.8 ±0.4	7.1	4500
	R122b	Eniaetok	Jan. 60			4.9	
	R122b	"	Jan. 59	21 ±2	1.8 ±0.2	5.3	1300
Centers	R 10c	Rongelap	Jan. 60	1.1±0.3	0.21±0.06	0.40	1200
	R 10c	"	Jan. 59	1.0±0.4	0.20±0.08	0.37	1200
	R 93c	Kabelle	Jan. 60			2.4	
	R 93c	"	Jan. 59	3.8±0.4	0.55±0.09	4.2	280
	R122c	Eniaetok	Jan. 60	2.0±0.8	0.25±0.10	0.4	2504
	R122c	"	Jan. 59	0.7±0.6	0.19±0.07	1.8	173
Leaves	R 11	Rongelap	Jan. 60	1		20.1	
		Jan. 59	Jan. 59	13 ±1	1.09±0.09	19.5	298
(native(2) prep.)	R132	Rongelap	Jan. 59	0.3±0.5(3)	0.13±0.23(4)	0.6	0

(1) Errors given were obtained from counting error.
(2) Starch extracted by repeated washing.
(3) For this determination 7g dried sample were used.
(4) μμc/g dried; wet weight not available.

see attached note

Where samples were analyzed at two different times results from both analyses are given.

Total calcium was determined by $KMnO_4$ titration of calcium oxalate in Dec. 59 and by EDTA titration using murexide indicator in Jan. 59. Calcium values are being rechecked where the discrepency between the two analyses is greater than 10%.

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Strontium-90 and Total Calcium in Tacca collected at Rongelap Atoll

			Sr^{90}[1] d/m/g dried	Sr^{90}[1] µµc/g wet	Ca mg/g dried	Strontium units
March, 1959						
corms	#1	Rongelap	2.0±0.3	0.20±0.03	0.24	3600
(centers)	#2		2.2±0.4	0.22±0.04	0.42	2400
	#3		1.1±0.3	0.11±0.03	0.30	1700
	#4		1.1±0.3	0.10±0.03	0.24	2000
	#5		1.5±0.4	0.15±0.04	0.35	2000
	Av.		1.8±0.4[2]	0.16±0.05[2]	0.31±0.07[2]	2400±700[2]
August 1958						
corms	1	Rongelap	51± 4	3.6 ±0.3	6.4	3600
	7	Kabelle	109± 7	5.9 ±0.4	15.7	3200
	9	Eniaetok	75± 6	3.3 ±0.3	16.6	2100
	11	Eniaetok	74± 3	4.3 ±0.1	10.4	3200
peels	1	Rongelap	113±12	3.4 ±0.9	8.9	3800
	7	Kabelle	184±24	12.3 ±1.6	11.3	7400
	10	Eniaetok	88± 6	3.8 ±0.2	16.7	2400
	11	Eniaetok	63± 4	3.0 ±0.5	11.2	2600
centers	1	Rongelap	19± 2	1.3 ±0.2	1.4	6000
	7	Kabelle	(3)	(3)	7.1	(3)
	10	Eniaetok	64± 4	2.1 ±0.1	12.5	2300
	11	Eniaetok	45± 3	1.9 ±0.1	9.3	2200
leaves	1	Rongelap	79± 6	4.7 ±0.3	4.8	7600
	7	Kabelle	90± 5	7.1 ±0.4	10.1	3600
	10	Eniaetok	60± 4	4.3 ±0.3	9.1	2900
	11	Eniaetok	60± 4	4.2 ±0.2	9.7	2300

(1) Errors given are obtained from counting error.
(2) Standard deviation
(3) Sr^{90} determination not yet done: result will be available later.

Comparison of Sr^{90} Levels in Land Crabs Collected at Rongelap Atoll in July 1956 and July 1957

Island	Tissue	Coenobita (land hermit crab) July 1956 — AFL d/m/g wet	AFL s.u.	NYO d/m/g wet	NYO s.u.	Birgus (coconut crab) July 1957 — AFL d/m/g dry	AFL d/m/g wet	AFL s.u.
Kabelle	Liver	42	6250	34	4600	180	78	4800
		47	3110	25	2620	310	160	35000
	Muscle	62	8890	16	4600	53	10	3200
		24	4910	9.5	2860	47	11	410
		90	5120	--	--	33	9.5	3800
	Skeleton	2400	5310	1550	3940	3600	2300	6800
		1310	2960	910	2190	2800	2000	4600
		2130	4440	1450	3600	4300	3000	6100
Rongelap	Liver	--	--	--	--	56	15	1600
		--	--	--	--	67	28	2000
	Muscle	--	--	--	--	10	2.5	150
		--	--	--	--	29	5.8	1900
	Skeleton	1310	3360	750	2200	1100	710	1700
		-	-	--	--	1800	1200	3000

STRONTIUM-90 in BONE SAMPLES FROM RATS COLLECTED AT RONGELAP ISLAND, MARCH 1958

Specimen No.	Sr^{90} d/m/g wet	Ca mg/g wet	Strontium ~~Sunshine~~ units
V-1	207 ± 17	181 ± 5	519
V-2	294 ± 19	243 ± 21	551
V-3	109 ± 11	183 ± 0	273
V-4	69 ± 7	99 ± 0	313
V-5	155 ± 12	113 ± 19	619
V-6	220 ± 14	108 ± 19	926
V-7	71 ± 7	104 ± 19	308
V-8	80 ± 9	118 ± 7	305
V-9	153 ± 15	130 ± 4	538
V-10	110 ± 14	143 ± 0	350
V-11	93 ± 9	157 ± 3	268
V-12	104 ± 12	137 ± 7	343
V-13	143 ± 10	125 ± 3	440
Average	139 ± 64	142 ± 38	443 ± 181

NOTES:

1. 0.95 counting error is given for individual Sr^{90} determinations.
2. Standard deviation of duplicate samples is given for Ca determinations.
3. Standard deviation is given for averages.

May 1958

June 1958

Sr^{90} in the Skeletons of Land Crabs collected at Rongelap Atoll

Island	Date of Collection	Laboratory	No. of Samples	Sr^{90} d/m/g dry	Sr^{90} d/m/g wet	Strontium units
Kabelle	July 1958	NYO	3		1300±280	3240±700
	"	U.W.	3		1950±470	4240±970
	July 1957	U.W.	3	3870±810	2430±490	5800±920
	March 1958	U.W.	5	3200±300	2360±210	6900±550
Rongelap	July 1958	NYO	1		750	1900
		U.W.	1		1810	4500
	July 1957	U.W.	2	1500±350	955±245	2350±550
	March 1958	U.W.	5	1660±441	1180±300	3140±860
Eniaetok	March 1958	U.W.	2	3200±800	2200±550	6000±1200

Radiostrontium in Land Hermit Crabs (*Coenobita* sp.)
Collected at Rongelap Atoll July 23-24, 1956

Radioactivity as of Counting Date, September 10, 1956

Specimen Number	Tissue	Island	Total activity d/m/g wet	Sr^{90} d/m/g wet	Calcium g/g wet	"Sunshine Units"	Sr^{89}/Sr^{90}
I-49	Liver	Kabelle	843	48±2	0.00304	6850±231	1.6±0.3
"	Muscle	"	394	62±22	0.00320	8890±3110	0.0
"	Skeleton	"	5410	2400±9	0.206	5310±19	0.24±0.08
I-50	Liver	Kabelle	633	47±14	0.00718	3110±946	3.6±1.6
"	Muscle	"	273	24±6	0.00823	4910±1170	2.4±0.75
"	Skeleton	"	4100	1310±3	0.208	2960±7	0.58±0.16
I-51	Muscle	Kabelle	444	90±6	[illegible]	[illegible]	0.71±0.05
"	Skeleton	"	5600	2130±139	[illegible]	[illegible]	[illegible]±0.04
I-52	Skeleton	Rongelap	3900	1310±5	0.177	3360±14	0.48±0.14

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[illegible] in Plants Collected at [illegible]

[illegible]

Plant	Tissue	Island	Total activity d/m/g wet	[illegible] d/m/g wet	[illegible]	[illegible]	[illegible]
Breadfruit	Pulp	Rongelap	42.0	0.[illegible]	[illegible]	[illegible]	[illegible]
Morinda	Pulp & Seed	"	80.4	3.1±0.1	0.[illegible]	[illegible]	[illegible]
Pandanus	Seed	"	79.7	2.2±0.6	0.00450	[illegible]	[illegible]
Arrowroot	Pulp & Skin	"	108	[illegible].5±0.6	0.00333	[illegible]	[illegible]
Coconut	Milk	"	262	0			
"	Meat	"	64.6	0			
"	Milk	Kabelle	36.9	0			
"	Meat	"	148	0			

Note: Specimen numbers will be forwarded later.

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