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BROOKHAVEN NATIONAL LABORATORY

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Memo to Dr. Roy Maxwell Dept.

Ray - Here are copies of Uremic and water analyses on Bipheni - The uremic values are quite low for ^{45}Ca & ^{137}Ca . See also Rongelap levels.

The lack of Pa in the urine is recurring. Through the radiochemical analyses on samples from our last months survey will be some time in coming we will try and pull together the former survey data for you soon -

from BEST COPY AVAILABLE Dept. Bob C.

Form 1128

Personnel Monitoring - Bikini

About 40 people living at Enue Island beginning 1969 moved to Bikini Island in 1972 along with about 20 women and children. In 1968 a number of radiochemical urine analyses were run on Bikini people living on Kili Island. The levels of ⁹⁰Sr and ¹³⁷Cs were low - about the same as people living on Ebeye (also an uncontaminated island).

Year	Sample	Vol (ml)	mg Ca/l	pCi/l			
				⁹⁰ Sr	¹³⁷ Cs	²³⁸ Pu	²³⁹ Pu
1970	urine (pooled)	3640	120	1.2	100	0.002 [±] 100%	0.002 [±] 100%
	"	3365	120	1.3	130	0.003 [±] 100%	0.003 [±] 100%
	urine G	1100		2.2 [±] 11%		0.013 [±] 100%	0.020 [±] 100%
	urine M	930		1.9 [±] 13%		0.015 [±] 100%	0.024 [±] 100%
	U.S. Control*	3000	160	1.0	12	0.003 [±] 100%	0.003 [±] 100%
	U.S. Control	1000		1.6 [±] 14%		0.14 [±] 100%	0.022 [±] 100%
1971	urine (pooled)	3920	54	0.96 [±] 4%	217 [±] 1%		0.004 [±] 100%
	"	2960	74	0.89 [±] 13%	194 [±] 1%		0.004 [±] 100%
	"	3300	110	1.22 [±] 2%	211 [±] 1%		0.004 [±] 100%
	"	500	100	3.9	110		
	Nasal smears - 10 people						0.005 [±] 100**
1972	urine (pooled)	2700	204	4.2 [±] 7%	910 [±] 1%		

*Health and Safety Laboratory, AEC, N. Y.

**Lower limit of detection - represents no plutonium

1973

	260	120	8.9	2.1
	280	100	5.7	1.1
	250	240	5.5	2.6
	65	160	7.4	4.2
	150	230	6.2	0.9
	115	360	11.6	2.1
- E - P	350	80	4.8	1.2
Bikini, M-7	485	120	2.2	0.6
Distian Rep. family	300	210	5.6	1.5
	380	300	5.4	0.5
	460	79	2.0	0.4
	220	130	18.9	1.3
	410	100	1.9	0.4
	390	200	7.8	2.0
			$\bar{x}=6.7$	$\bar{x}=1.5$

COCONUT GRAHS - BIKINI

Year	Orig wt (g)	% Ash	g ca per kg orig.	pCi/kg Orig.			
				⁹⁰ Sr	¹³⁷ Cs	²³⁸ Pu	²³⁹ Pu
1970	1164	23.3	81	23,300	11,800	0.06±50%	1.5±10%
	1930	18.5	61	24,800	14,800	0.001±100%	0.07±37%
1971	1812	17.8	60	132,000	11,400		
		21.5	72	412,000	8,600		
1973	1190		63.5	45,700	9,290		

WELL WATER - BIKINI

Year	Sample	Vol (ml)	pCi/l			
			⁹⁰ Sr	¹³⁷ Cs	³ H	²³⁹⁻²⁴⁰ Pu
1971	"good well"	1830	6.0±17%	600±1%	770±40%	0.04±25%
	"bad well"	1830	25±3%	850±1%	1040±30%	0.05±20%
	"good well" (closed)	1810	103±2%	1044±1%		0.058±15%
	"good well" (opened)	1980	125±3%	818±1%		5.76±6%
	Drinking Water (camp area)	3580	0.46±4%	1.53±8%		0.004±100%
1972	well water	1000	15.4±9%	800±1%		
	Drinking water	1960	0.61±6%	1.8±8%		
1973	new well-Bikini	60	52	660		0.38 ± 40%
	B-1 well - Bikini	225	11	724		0.08 ± 50%

Project for Comparison

PERSONNEL MONITORING - RONGELAP

URINE

<u>Year</u>	<u>No.</u>	<u>Vol. (ml)</u>	<u>mg Ca per liter</u>	<u>pCi Sr⁹⁰ per liter</u>	<u>nCi Cs¹³⁷ per liter</u>
1970	7	2500	180	2.2	1.5
	9	2680	68	1.0	0.80
	11	1100	91	1.4	1.0
	34	270	220	4.2	3.1
	48	920	34	5.8	3.1
	53	980	170	7.3	2.5
	67	455	75	6.4	5.2
	70	135	52	2.4	1.3
	73	525	97	2.3	4.1
	80	1540	200	2.0	1.7
	805	275	110	7.4	4.4
	811	265	600	6.5	3.9
	835	330	110	5.7	4.1
	881	540	74	1.7	2.8
	882	1180	76	1.0	0.87
	934	920	150	2.5	3.5
	948	800	180	2.0	0.77
	1050	620	120	1.6	2.1
	1520	355	220	3.3	4.0
	1523	1520	220	<u>3.4</u>	<u>2.6</u>
			X=3.5	X=2.7	
1971	34	625	130	3.7	5.9
	41	590	130	2.1	1.2
	61	1260	67	2.6	0.45
	66	560	160	2.4	2.7
	67	260	870	8.3	4.6
	73	830	210	2.6	2.1
	77	700	87	3.1	2.7
	802	210	160	9.7	3.7
	825	470	110	6.3	2.5
	827	330	200	2.5	2.0
	834	320	280	3.3	2.2
	864	830	140	2.6	2.2
	932	1220	55	1.3	1.4
	948	440	33	0.90	0.34
	1520	470	240	3.7	2.5

PERSONNEL MONITORING - RONGELAP

URINE

<u>Year</u>	<u>No.</u>	<u>Vol. (ml)</u>	<u>mg Ca</u> <u>per liter</u>	<u>pCi S⁰</u> <u>per liter</u>	<u>nCi Cs¹³⁷</u> <u>per liter</u>	<u>pCi Pu^{239,240}</u> <u>per l</u>
1972	1	580	100	2.3	1.2	
	14	960	91	2.6	2.6	
	17	680	23	2.2	5.9	
	34	85	84	≤1.0	6.1	
	48	250	29	1.7	7.0	
	73	980	86	3.4	4.2	
	845	385	360	2.3	2.9	
	878	290	60	2.2	5.0	
	882	470	110	1.3	1.3	
	896	330	190	6.4	2.1	
	1050	350	150	1.3	2.9	
	1517	510	40	1.5	1.0	
	2228	240	190	2.4	0.8	
	2257	330	170	1.6	1.2	
	2136	625	200	0.9	1.3	
	2177	640	66	0.6	0.6	
	2195	120	160	≤0.8	0.7	
	2195	470	56	<u>1.0</u>	<u>0.5</u>	
			X=2.4	X=2.6		
1973		417	200	8.0	1.8	0.02 ± 100%
	12	180	210	7.7	2.7	0.05 ± 100%
	17	200	74	8.3	7.7	0.09 ± 50%
	48	410	32	2.8	1.9	0.02 ± 100%
	64	170	430	12.5	5.8	0.05 ± 100%
	66	432	190	2.8	2.1	0.05 ± 40%
	73	440	270	3.8	3.7	0.02 ± 100%
	80	215	620	5.1	5.3	0.06 ± 70%
	832	37	130	4.3	6.2	1.7 ± 30%
	835	120	73	4.8	6.0	0.11 ± 70%
	843	125	490	<u>10.9</u>	<u>8.1</u>	0.11 ± 70%
			X=6.45	X=4.56		

COCONUT CRABS - Rongelap

Year	Sample	Orig. Wt. (g)	g Ca per Kg. Orig. Wt.	pCi/kg (orig. wt.)	
				⁹⁰ Sr.	¹³⁷ Cs
1969	1	317	58.7	53,200	8,540
	2	585	68.0	33,982	7,010
1972	Across pass	1890	76	28,600	5,600
	" "	1965	93	39,000	6,100
	Rong. Is.	1360	86	30,900	6,800
	Across Lagoon	1235	90	23,300	5,100
	Northern Is.	1902	60	56,000	12,900
1973		821	48.8	324,000	64,700
		2145	67.9	86,000	9,430

FETUS SAMPLES - RONGELAP

Year	Sample	Wet Wt. (g)	Mg Ca per g orig. wt.	pCi - total sample	
				⁹⁰ Sr	¹³⁷ Cs
1970	fetus	20.8		1.5	0.13
	placenta	35.4		50.3	5.2
1972	fetus (j)	6.02	3.6	0.007 \pm 100%	0.05 \pm 53%
	fetus (R)	8.36	1.6	0.016 \pm 35%	0.02 \pm 100%