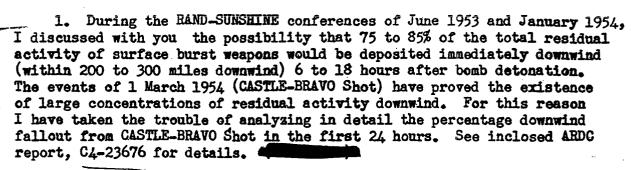
## MARSHALL ISLANDS FILE TRACKING DOCUMENT

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File Name (TITLE): MEMO Edural N. M. Lulejian  W. F. LIBBY From N.M. Lulejian
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(U) World-Wide Contamination



2. I believe that this fact has a distinct bearing on the validity of SUNSHINE assumptions of the Strontium 90 burden imposed by explosions of nuclear weapons. In Table I, I have listed all of the known explosions of atomic weapons to date. Then I have assumed that for tower shots (15 to 50KT from 300 ft towers) 10 to 30% of the residual activity is scavenged out in several hours by the soil, and hence is not available for world wide distribution. Similarly, I have assumed that for 25KT exploded from a 100 ft tower, 50% of activity is scavenged out by the soil. For surface shots, it is assumed that 80% is soil-scavenged out and therefore unavailable for world wide contamination. (Proof of these assumptions are in the inclosed ARDC Report).

3. In the Chicago baby experiments (reported by you in the January 1954 conference) you showed that new born babies in the Chicago area have about 1/6 SUNSHINE Unit of Sr90 or about 1/6000 of tolerance. On the basis of the original SUNSHINE estimate of an even distribution of 25,000 MT of debris to bring the world population up to tolerance, 4MT would give the Chicago babies the observed deposition. Since these experiments were concluded in 1953, it is assumed that Joe 4 (or TN Joe I) detonated in August 1953 did not add to the Sr90 burden of the Chicago babies. Table I shows that although a total of were detonated by 1952, only a maximum of were available for world wide contamination. It is my contention were available for U.S. deposition (see last two columns of Table I). Even if this is not true, and only the maximum value is used, it is still less than the AMT found by your experiment in the chicago babies. It should be further pointed out that by the end of 1953, only 50% of the available atmospheric atomic debris had reached the ground. If this is true then we only had low as available for the Chicago babies. And yet their uptake was 4MT by SUNSHINE estimates. The conclusion is inevitable that the SUN-SHINE estimates are not conservative as popularly believed in many quarters. Oh the contrary SUNSHINE underestimated the Sr90 hazard. Many people have assumed that the SUNSHINE overestimates the Sr90 uptake by factors of 10 or even 30. The statement is also made that the Chicago baby uptake of 3r90 was not through the plant-animal-man cycle, but that the fission pro-**Educts were picked up by the animal (cow) directly from fallout that ex**ternally covered plant life, and this was then passed on to the mothers

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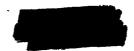
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## Memo, (U) World-Wide Contamination

the Chicago babies. It seems to me that regardless of the mode of introduction of Sr90 into the human biological cycle, that fact that the Chicago babies picked up 1/6 SUNSHINE unit from a total available debris which may have been as low as for even is quite significant. It would be interesting to repeat the Chicago baby experiment in 1955. If the babies show an uptake of 1/2 SUNSHINE unit or more in 1955 the original SUNSHINE estimate of 25,000MT allowable may have to be lowered to 10,000 or 15,000MT. Your attention is particularly invited to Figure 11 of the inclosed report.

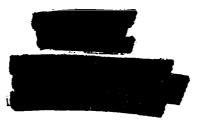
4. This document classified the in accordance with paragraphs 23b and 56, AFR 205-1.

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N. M. LULEJIAN
Lt Colonel, USAF
Atomic Operations Division

DOE ARCHIVES



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## TABLE I

TOTAL THRU 19	· 52	DELETER	DELETER	NEI FIEL	DELETEIL &
King		350	550	300	300
Ivy Vike	Nov 52	JELETED	DELETED	MELETEL	DELETEL
Snapper	May 52	57	45	45	
Tumbler	Apr 52	55	55	55	30 20
Jangle	Nov 51	2	0.5	0.5	0
Joe 2 and 3	Nov 51	40 2	<b>40</b>	20	10
Buster	Nov 51	72	72	72	50
Greenhouse	May 51	400	300	150	75
Ranger	Jan 51	40	40	40	30
Jee I	Sept 49		20	10	, 5
Sandstone	May 48	105	50	25	.i. 5
Crossroads	Jul 46	40	• 15	7	1
Nagasaki	Aug 45	22	22	n n	2
Hiroshima	Aug 45	14	14	7	1
Trinity	Jul 45	24	12	12	10
PERATION	DATE	(Fission)	CONTAMINATION	บ.ร.	ATION
EST		IN KT	WIDE	; <b>0</b> F	CONTAMIN_
	;	YIELD	WORLD-	CONTAMINATION	CAGO AREA
		TOTAL	ABLE FOR	ABLE FOR	FOR CHI-
			AVAIL-	AVAIL-	AVAILABLE
ì			YIELD	YIELD	YIELD

	i
Joe 4	Aug 53
CASTLE	Mar 54
Bravo	
Romeo	•
Koon	,,
Union	*
Yankee	14
Nectar	

GRAND TOTALS UP TO JUNE 1954











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