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RADIOACTIVE DEBRIS FROM THE
CHINESE NUCLEAR TEST OF JUNE 17, 1974^(a)

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According to the news media, the Chinese People's Republic detonated a nuclear device estimated to have a yield between 0.2 and 1 megatons on June 17, 1974. Radioactive debris from this test was observed at our Richland, Washington laboratory on June 24, 1974, approximately seven days after this detonation. The radionuclide levels were extremely low and required 1000-minute counts on our most sensitive instruments for the measurement on air filters. After the initial observation, airborne radioactivity was below our detection limit until June 29, 1974, when it was approximately four-fold higher than on June 24. No further observations of these short-lived radioactive debris have been observed through July 17, 1974. A summary of the atmospheric concentrations is contained in Table I. The maximum concentrations are approximately one-fourth of those observed at our laboratory from the June 26, 1973 Chinese nuclear test and were approximately two orders of magnitude lower than airborne concentrations observed from the March 18, 1972 test.

A survey of radioactivity levels on grass samples collected at approximately 40-mile intervals between Los Angeles and the Canadian border indicated very low concentrations. Only less-than values could be determined for these grass samples and these are reported in Table II. The maximum possible ^{131}I

radiation exposure for the grass-milk-man pathway for the U. S. West Coast is < 0.042 mrem, based on a two-gram child thyroid. This is far below the Protective Action Guide of 30 rem recommended for the general population by the Federal Radiation Council. These ^{131}I thyroid exposures are two to four orders of magnitude lower for U. S. West Coast residents than those from the March 1972 nuclear tests.

It is important to recognize that while these last three Chinese nuclear tests have had yields that were apparently of the same order of magnitude, the fallout debris and associated radiation exposure on the West Coast varied by approximately four orders of magnitude. This wide variation in U. S. population exposure for similar sized nuclear device tests re-emphasizes the importance of understanding both the atmospheric transport and the nature of the debris.

TABLE I

ATMOSPHERIC CONCENTRATIONS OF FALLOUT DEBRIS FROM THE
CHINESE NUCLEAR TEST OF 6-17-74 IN SURFACE AIR AT RICHLAND, WA¹

<u>Date</u>	<u>Air Volume 10³m³</u>	<u>dpm/10³ SCM</u>										
		<u>¹⁴⁷Nd</u>	<u>⁹⁹Mo</u>	<u>¹⁴¹Ce</u>	<u>²³⁷U</u>	<u>²³⁹Np</u>	<u>¹⁴³Ce</u>	<u>¹³¹I</u>	<u>⁹⁷Zr</u>	<u>¹³²I</u>	<u>⁹⁵Zr²</u>	<u>¹⁴⁰Nd</u>
6/24-25	14.0	3.8±0.5	31±0.3	4.5±0.2	33±2	147±7	--	4.6±0.5	--	4.9±1.3	--	3.4±0.3
6/29-30	17.3	13±2	--	10.5±0.2	177±2.5	752±69	--	9.8±0.5	--	3939±5	26±0.6	16.5±0.5

¹ Decay corrected to 6-17-74.

² Combined fallout from 6-23-73 and 6-17-74 Chinese tests.

TABLE II

DETECTION LIMITS FOR FALLOUT RADIONUCLIDES INAIR AND GRASSConcentrations¹

(dpm/sample)

<u>Sample</u>	<u>¹⁴⁷Nd</u>	<u>⁹⁹Mo</u>	<u>¹⁴¹Ce</u>	<u>²³⁷U</u>	<u>²³⁹Np</u>	<u>¹⁴³Ce</u>	<u>¹³¹I</u>	<u>⁹⁷Zr</u>	<u>¹³²I</u>	<u>⁹⁵Zr</u>	<u>¹⁴⁰Pr</u>
Filters	0.86	4.3	0.67	1.7	1.1	1.0	0.6	0.6	0.46	1.3	1.1
Grass	8.2	16	3.2	7.5	7.6	4.1	2.3	2.2	1.9	1.2	3.8

¹ Numbers based on 1000-min. Ge(Li) diode counts; 1σ level of confidence.

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