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Radioactive Samples from Japan

The table below summarizes the usefulness of radioactive samples which might be recovered from Japan in order to determine the nuclear efficiencies.

Ground Radiation R/hr (After 10 Days)	Curies Per Gram of Dirt (After 10 Days)	Value of Sample 49 Gadget	Value of Sample 25 Gadget
Less Than 0.1	3×10^{-5}	Useless	
1	3×10^{-4}	Poor	Useless
10	3×10^{-3}	Good	Poor
100	3×10^{-2}	Excellent	Good

For the 49 gadget we have considered that the detectable limit of 49 is an alpha count of 35 counts per minute which corresponds to 5×10^{-10} grams of 49. We are equipped to handle 2-gram samples of dirt so that the minimum concentration of 49 per gram of dirt is 2.5×10^{-10}. The table gives the number of curies per gram of dirt and the radiation in R/hr from a large surface distribution over the ground assuming that the efficiency is 16%.

For the 25 gadget the detectable limit of concentration of 25 in the dirt was taken to be 5×10^{-8}. This is approximately the concentration of 25 naturally found. The radiation from the dirt was based on an efficiency of 1.6%.

About 4 active samples of about 100 grams each should be collected, as well as an equal number of dead samples, especially in the case of the 25 gadget, for background purposes. The concentration of active material will be greatest in the finest samples, and a considerable advantage can be obtained by sieving the dirt through a 200-mesh sieve. Smooth metal surfaces on which sizeable amounts of active material are deposited would be very useful.

FINAL DETERMINATION
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L. M. Redman
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