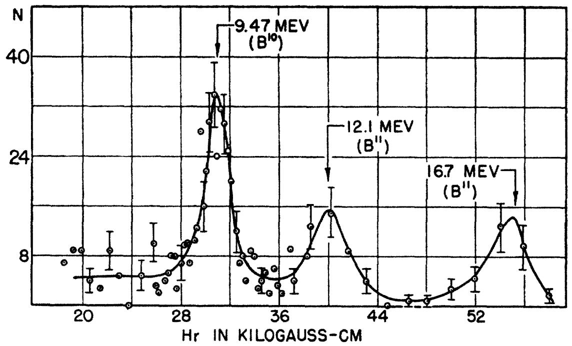

FIG. 2. Spectrum of gamma-rays emitted by a thick target of separated B^{10} isotope when bombarded by 1.2-Mev protons. In addition to the single line at 9.47±0.12 Mev from B^{10}, lines at 12.1 and 16.7 Mev from residual B^{11} are observable. The spectrometer radiator was 0.003-in. Pb.

obtain further information about the radiation from the 1077-kev resonance data were taken with a thin Be target (approximately 0.9 mg/cm²) and a proton energy of 1.21 Mev. The results are shown in Fig. 3b, where a gamma-ray of energy 6.82±0.10 Mev is resolved from the 7.48-Mev line.

TABLE I. Order of magnitude of the relative yields of gamma-radiation from thick targets of Li^7, B^{10}, B^{11}, and Be^9.[a] (An estimate of the probable error is perhaps a factor of 2.)

Target	Proton energy (Mev)	Gamma-ray energy (Mev)	Relative yield (gamma-rays/proton)
Li metal	0.460	17.6 ±0.2 14.8 ±0.3	1.0 0.5
B^{10}	1.2	9.47±0.12	0.018
B_4C (normal boron)	1.2	16.70±0.17 12.12±0.12	0.11 0.23
B_4C (normal boron)	0.51	16.34±0.25 11.76±0.18	0.0022 0.009
Be metal	1.2	7.37±0.07 6.71	1.5

[a] The absolute yield of Li gamma-rays is given by W. A. Fowler and C. C. Lauritsen [Phys. Rev. 76, 314 (1949)] as 1.90×10^{-8} gamma-ray per proton.

No attempt was made to measure accurately the yield of gamma-rays from B^{10}, B^{11}, and Be^9, but since the order of magnitude may be of interest, rough estimates of the yields relative to that of the 17.6-Mev lithium gamma-rays are given in Table I.

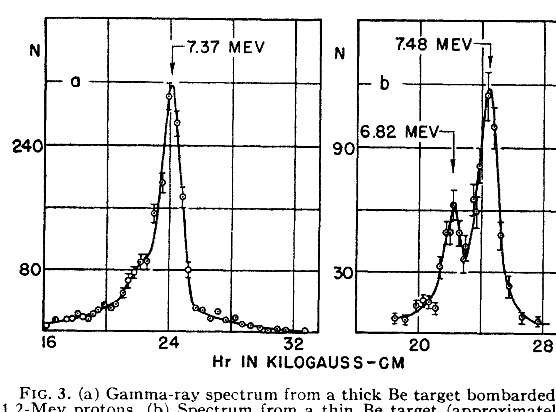

FIG. 3. (a) Gamma-ray spectrum from a thick Be target bombarded with 1.2-Mev protons. (b) Spectrum from a thin Be target (approximately 0.9 mg/cm²) bombarded with protons of energy 1.21 Mev. Both curves were obtained with a 0.002-in. Cu radiator in the spectrometer. The slight increase in the energy of the "7.4-Mev" gamma-ray seen in curve b can be ascribed to an increase in the effective proton energy. Curve a shows radiation produced mainly by protons at the 0.99-Mev resonance, while the protons for curve b have an energy near 1.08 Mev.

I am indebted to Mr. Robert Rochlin for help in taking the data and to the AEC for loaning the B^{10} sample.

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† Now at the California Institute of Technology, Pasadena, California.

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Superconductivity of Sn^{124}*

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OUR measurements[1] of the critical fields and superconducting transition temperatures of mercury isotopes are being extended to the isotopes of tin and thallium. We have obtained preliminary results with an enriched sample of Sn^{124}. This sample, kindly loaned to us by the AEC, contained 83.4 percent of Sn^{124} by weight, and had an average atomic mass, M, of 123.1. (The atomic mass of natural tin is 118.7.) Spectrochemical analysis revealed a total chemical impurity content of less than 0.01 percent. Elements detected were Mg, Pb, Si, Ag, Al, B, Cu.

The experimental method was essentially the same as that employed with the mercury[1] and consisted in observing magnetically the destruction of superconductivity. The specimen was about 50 mg in weight and was in the form of a wire cast in a Pyrex capillary.

TABLE I. Transition temperature of Sn.

Sample	M	T_c°K
Natural	118.7	3.715
Enriched in Sn^{124}	123.1	3.662

The results are given in Table I. The data for natural tin are taken from Laurmann and Shoenberg.[2]

It is seen that the effect of increasing the mass is to shift the transition temperature to lower temperatures, exactly as was found in the case of mercury.[1,3] On the basis of these meager data the shift in temperature is apparently 0.012°K per mass unit. In the case of mercury it was about 0.007°K per mass unit, obtained by using our data[1] and that of Serin, Reynolds, and Nesbitt.[4]

These measurements are being extended and will be reported in detail later.

* Supported by ONR.
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Measurement of the Gamma-Ray Energy of K^{40}

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THE energy of the gamma-ray accompanying K-capture of K^{40} has been measured by a scintillation spectrometer in which NaI-TlI has been substituted for the usual anthracene so that the photo-electrons rather than Compton electrons are used to produce the light pulse in the phosphor.

Anthracene and the other organic phosphors give substantially only the Compton process with gamma-rays from 100 kev to 2 Mev and pair formation within the phosphor is very small even at 2.76 Mev.

Sodium iodide, thallium activated, on the other hand gives strong photoelectric effect in the iodine even at 2.76 Mev and pair production at this energy is prominent and can be seen as