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* Supported in part by the ONR.
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The Nuclear Magnetic Moment of Scandium45

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IN a recent letter with the above title in this journal, Sheriff and Williams[1] present a value of 4.7617 ± 0.0010 nuclear magnetons for the magnetic moment of Sc^{45} after having made a diamagnetic correction of 0.260 percent in accordance with Lamb's[2] formula.

It is the purpose of this note to point out that the diamagnetic correction according to Lamb's formula is 0.151 instead of 0.260 percent. When Sheriff and Williams' experimental results are recalculated with this value of the Lamb correction they give for the magnetic moment of Sc^{45}

$$\mu(Sc^{45}) = 4.7564 \pm 0.0010 \text{ nuclear magnetons.}$$

Although the result of Sheriff and Williams originally disagreed with the recent results of Proctor and Yu[3] and Hunten,[4] the above correction brings it into agreement within the experimental limit of error.

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Gamma-Rays of Ag^{105} and Ag^{106}

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THE gamma-rays of Ag^{106} (8.2*d*) and Ag^{105} (45*d*) have been measured by Enns[1] and Deutsch *et al.*[2] The results are shown in Table I.

Since the measurements were made a number of years ago when techniques had not been developed to their present state, it was decided to repeat these measurements. In addition it was hoped that the energy levels of Pd^{106} determined from K-capture in Ag^{106} could be checked against those determined from the disintegration of Rh^{106}.

In the present experiments Ag^{106} and Ag^{105} were produced by bombarding Pd with deuterons or Rh with alpha-particles in the Indiana University cyclotron. The first reaction also gave some Ag^{111} in addition to Ag^{105} and Ag^{106}. In no case were Ag^{106} and Ag^{105} produced separately since in the bombardment with alpha-particles both $Rh(\alpha, n)$ and $Rh(\alpha, 2n)$ reactions took place. Chemical separations to isolate silver were made. The assignment of the lines to the several isotopes was made by watching the decay of the source.

The lines having an 8-day period, and hence attributed to Ag^{106}, have energies of 0.515, 0.722, 1.04 and 1.54 Mev. In comparing these results with those of Peacock[3] on Rh^{106} it is to be noted that he finds lines at 0.51, 0.75 and 1.25 Mev but none at 1.04 and 1.54 Mev, while the line at 1.26 Mev is not seen in Ag^{106}.

The gamma-rays associated with the 45-day period, Ag^{105}, have energies of 0.064, 0.278, 0.340 Mev with two weak lines at 0.220 and 0.437 Mev. From energy considerations it would appear

TABLE I. Early measurements on gamma-rays of Ag^{106}, Ag^{105}.

	Ag^{105} (Energy in Mev)	Ag^{106} (Energy in Mev)
Enns	0.29, 0.42, 0.51, 0.62	0.69, 1.06
Deutsch, Roberts, Elliott	0.282, 0.345, 0.430, 0.650	0.505, 1.06, 1.63, 0.72(?)

that the line at 0.340 Mev is probably in parallel with the lines at 0.278 and 0.064 Mev which are in cascade. The lines 0.220 and 0.437 Mev are probably in another branch of the K-capture process.

The source produced from the Pd(*dn*) reaction contained Ag^{111} (7.5 days). The beta-ray spectrum was measured and a Fermi plot made of the data. The beta-ray spectrum of Ag^{111} appears to be simple with an end point at 1.06 Mev, in agreement with the work of Helmholtz, *et al.*[4] In addition, internal conversion lines for gamma-rays at 0.515 (Ag^{106}), 0.338, 0.278 and 0.064 (Ag^{106}) were obtained. An Auger line at 19 kev was observed which corresponds to the $K-L-M$ energy difference in Pd.

We are indebted to Dr. M. B. Sampson and the cyclotron crew for making the bombardments.

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Detection of Scintillations from Crystals with a Photo-Sensitive Geiger-Müller Counter*

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PHOTO-SENSITIVE Geiger-Müller counters have been the subject of long study at this laboratory. Very high quantum efficiencies, as indicated by his often-mentioned starlight experiments, were achieved by Locher[1,2] who employed a multitude of photo-cathode surfaces in making his photon counters at Bartol. Locher's account[1] of his work in photo-sensitive surfaces at the Rice Institute remains even today one of the very best available discussions of photon counting.

Glasser and Beaseley[3,4] describe interesting measurements in which long-period *phosphorescence* from gamma-rays on NaCl was observed with the use of a photo-sensitive G-M counter. This type of emission is to be differentiated from instantaneous fluorescence employed in the detection of nuclear particles by photo-multipliers.

Interest in photon counting was revived at Bartol when Scherb[5] discovered a discharge technique at liquid air temperatures which increased considerably the photo-sensitivity of the thus treated counter. The use of scintillating phosphors in conjunction with photo-multipliers again focused attention at this laboratory on the possibility of detecting fluorescent scintillations with G-M counters, and the feasibility of photon counters for scintillation detection was speculated upon in discussions at Oak Ridge.[6]

In the past several months, the writers have devoted considerable effort to reproducing many of Locher's early photon counters in an effort to attain sufficient quantum efficiency to detect scintillations from currently used crystals such as NaI. However, difficulties were encountered in matching the wave-lengths of the scintillations from the crystals with the peak of the spectral response of the cathode surfaces of the various counters. The alkali metals were usually employed, but it was found that appreciable response at wave-lengths greater than 3600A was difficult to obtain. Moreover, counters of the alkali metals seemed to have a high background arising, perhaps, from thermionic effects.

Finally it was decided to abandon the attempt to find cathode surfaces suitable for use with currently available crystals and to concentrate upon development of crystals which might fluoresce