The presence of large induced magnetic hyperfine fields at Gd nuclei in Gd metal and GdFe₂ has been inferred from measurements in applied magnetic fields [1]. The only feasible explanation for such large induced fields appeared to be the possibility of dramatic changes in the conduction electron polarization, caused by the external fields. Such changes, presumably, would require the introduction of an entirely new interaction mechanism.

In an attempt to elucidate the nature of the proposed interaction, we measured the hyperfine field at ¹¹⁹Sn nuclei in dilute alloys of Sn in Gd in external magnetic fields, using recoilless resonance absorption. No contribution from induced fields was observed. We therefore remeasured the external magnetic field dependence of the hyperfine field at Gd sites in GdFe₂ by performing recoilless gamma-resonance measurements of the 86.5 keV transition in ¹⁵⁵Gd, with a source of Sm₀.₀₅Al₀.₉₅ and an absorber of GdFe₂. The latter was produced by arc-melting and subsequent annealing at 800°C under vacuum for a week [2]. Source and absorber were cooled to 4.2 K. A superconducting solenoid produced longitudinal magnetic fields of up to 56.6 kOe at the absorber. The stray field at the source was varied from 2.3% to 50% of the field at the absorber by changing the source position.

The observed field at the ¹⁵⁵Gd nucleus in GdFe₂ as a function of applied field (corrected for demagnetizing effects) is shown in fig. 1. With the source in low stray fields, the applied field simply adds to the hyperfine field (positive in GdFe₂), i.e., no induced fields are observed. With the source in a large stray field, an anomalously large splitting is observed, which we attribute to hyperfine structure in the source induced by large fields at low temperatures, i.e., paramagnetic hfs. The fact the splitting increases with increasing external field at the source in the absence of induced fields in the absorber is due to induced hyperfine splitting in the source in the stray fields and are not due to fields induced in the absorber. We note that reducing the stray field down to 20 kOe does not affect the source splitting because it is still in the saturation region of the Brillouin function.

We conclude that the reported anomalous splittings [1], which exceeded the applied fields by factors of the order of 5, are due to induced hyperfine splitting in the source in the stray fields and are not due to fields induced in the absorber. We note that reducing the stray field down to 20 keV does not affect the source splitting because it is still in the saturation region of the Brillouin function.
 dictates that the hyperfine field in the source is negative.

In a longitudinal configuration, the polarization conditions can result in the observation of "ano-