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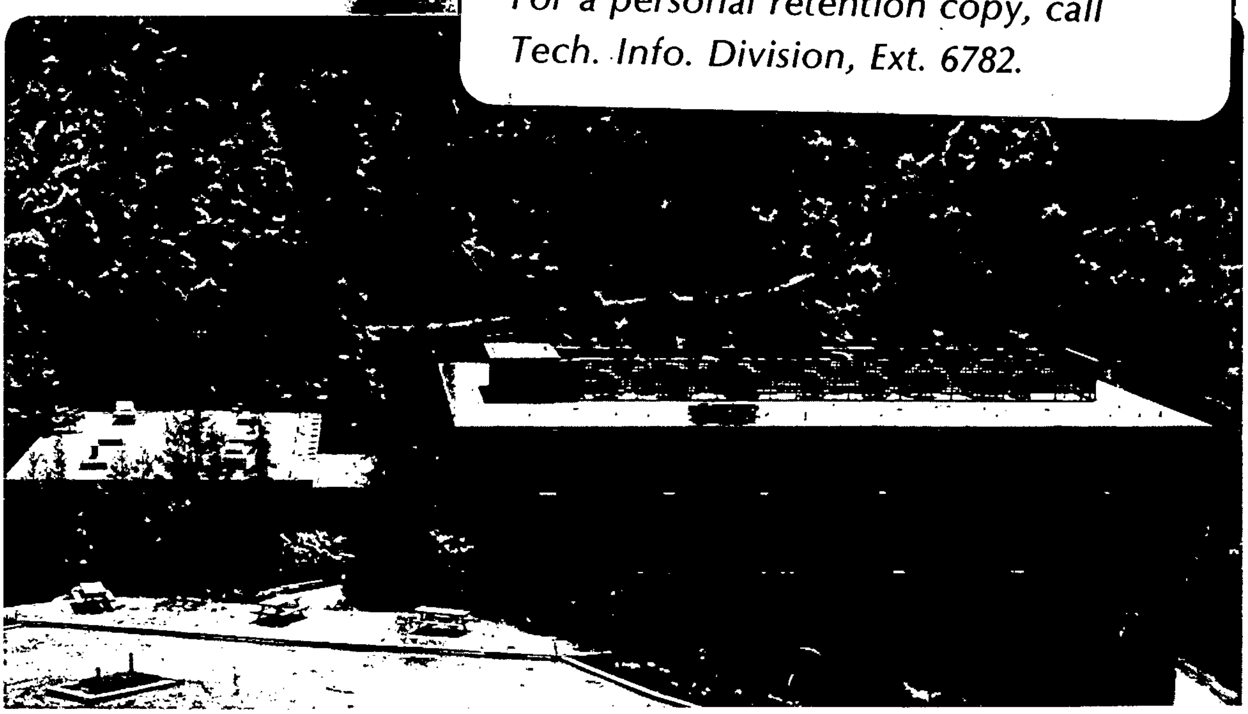

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The preceding three comments (by WM GS and BL, respectively) address, from different points of view, the use of the parabolic approximation for C(H) in relating $(\partial C/\partial H)_T$ to $(\partial^2 M/\partial T^2)_H$. That approximation was consistent with the available information on non-linear effects in M(H), and was in good agreement with the heat capacity data between 400 and 1000 Oe, the only region in which useful sensitivity in $(\partial C/\partial H)_T$ was obtained. (Contrary to the suggestion by WM, the inclusion of an H^4 term was not useful in fitting the data discussed in Ref. 1). As noted in the Comments, however, recently published data[2,3] give new information on the H dependence of χ and, therefore, on the expected H dependence of C. In particular, it has been shown[2] for AgMn that near T_{sg} the nature of the non-linear effects changes at low H. New dc, field-cooled χ data from this laboratory on a sample similar to that used in the heat capacity measurements[1] are shown in Fig. 1 as $(\partial\chi/\partial T)_H$ (at H>245 Oe, Berton et al.[4] have reported similar results). At 4.25 K the average field derivative of $(\partial\chi/\partial T)_H$ between 8.6 and 400 Oe is 3.5 times greater than between 400 and 1000 Oe. At 400, 600, 800, and 1000 Oe the increases in $(\partial\chi/\partial T)_H$ between 4.25 and 3.00 K are, respectively, 2.13, 1.82, 1.55 and 1.45 x 10^{-4} emu/mole alloy-K. Similar quantities derived from C(H) are 1.69, 1.72, 1.70 and 1.57 x 10^{-4} emu/mole alloy-K. Since the precision in $(\partial C/\partial H)_T$ is lower at 400 Oe than at 1000 Oe, this agreement should be regarded as satisfactory. Thus, and as also suggested by WM and GS, but contrary to our earlier conclusion, the data of Ref. 1 are consistent with M(T) and the Maxwell relation to within the rather strongly field dependent precision with which $(\partial C/\partial H)_T$ was determined.

The observed effect of H on C is typically several orders of magnitude smaller than BL'S calculation might seem to imply. (The difference appears to be associated with a large field-independent contribution to the calculated C that is determined only by comparison with experiment). If the deviations from the parabolic fits scale accordingly, they are generally well beyond the resolution of existing C data. Maxima in C(H), or the corresponding inflection points in $\chi(T)$ that correspond approximately to that in the model calculation for 1.06 T_{sg} have been observed. They are to be expected on rather general grounds — they are associated with the shift[5] in the maximum in C(T) to higher T with increasing H. This shift produces a line, $T_2(H)$, along which $(\partial C/\partial H)_T$ changes sign. The maxima in C(H) are less pronounced at lower T. They are not observable in our C data below, very roughly, 5.5K and 1000 Oe, but $T_2(H)$ is apparently continued as a locus of inflection points in $\chi(T)$ — the minima in $(\partial\chi/\partial T)_H$ in Fig. 1. It is interesting to note that there is also an inflection point in $\chi(T)$ at $T_1(H) < T_{sg}$ [the locus of the maxima in $(\partial\chi/\partial T)_H$] which is not a feature of the model, but which is probably of considerable significance for the spin glass state.

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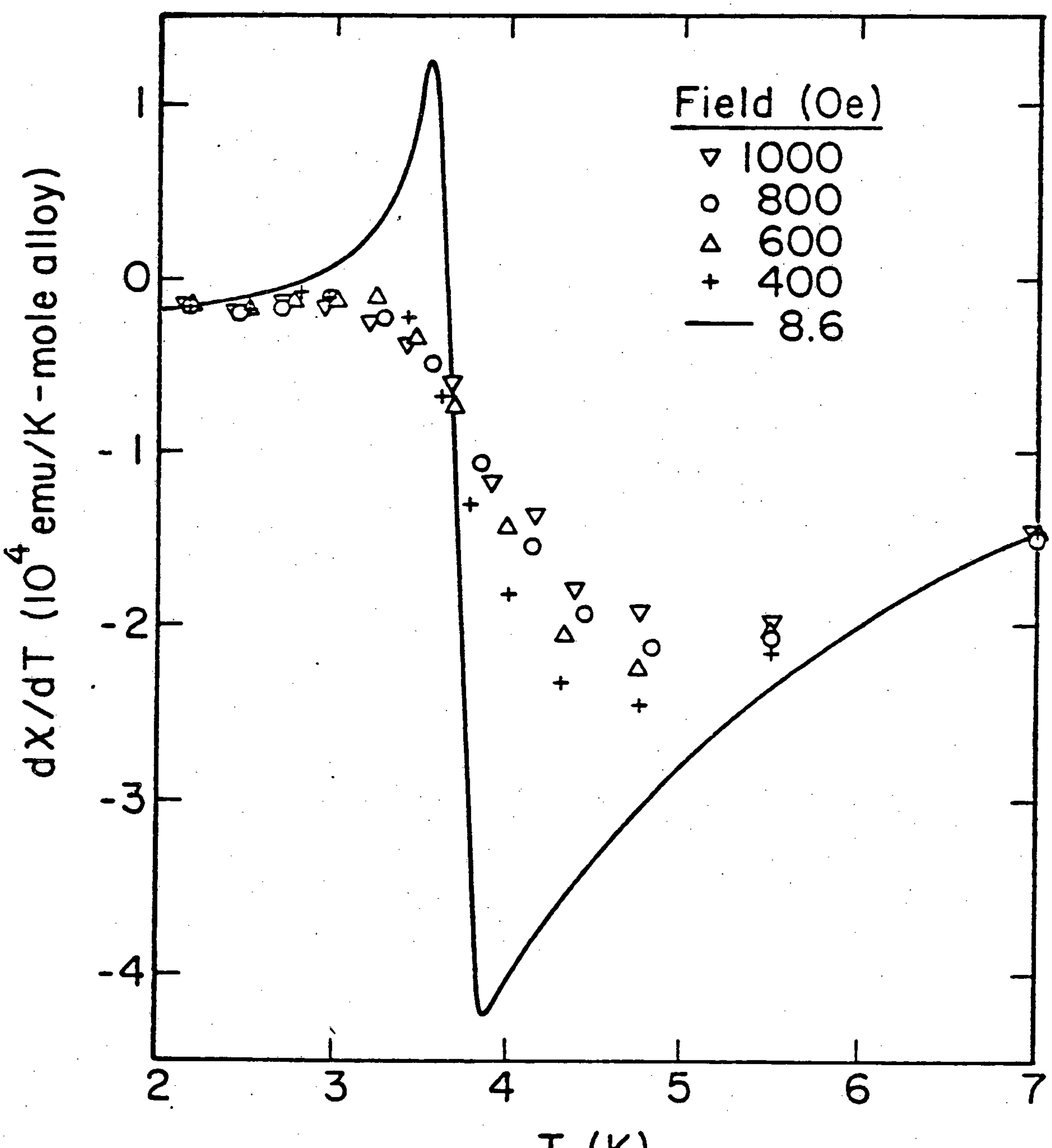
Fig. 1 $(\partial\chi/\partial T)_H$, obtained as point-to-point differences between successive $\chi(T)$ points.



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