

Hasan, F.A., Sears, D.W.G. and Cassidy, W.A. (1988) Evidence for a relationship between the natural thermoluminescence and the Antarctic meteorite recovery locations. *Meteoritics*, **23**, 273.

Evidence for a Relationship between the Natural Thermoluminescence and the Antarctic Meteorite Recovery Locations. Fouad A. Hasan,¹ Derek W. G. Sears¹ and William A. Cassidy.² ¹Cosmochemistry Group, Department of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR 72701 USA. ²Department of Geology and Planetary Sciences, University of Pittsburgh, Pittsburgh, PA 15260 USA.

The discovery of a large number of meteorites in Antarctica poses interesting questions concerning concentration mechanisms, and it also poses a challenge concerning the selection of the most scientifically significant meteorites. Petrographic surveys identify meteorites which are compositionally unusual, but not compositionally normal meteorites with unusual histories. Natural thermoluminescence (TL) measurements, which can be performed on large numbers of specimens, identify meteorites with unusual thermal and radiation histories, such as high temperatures due to recent shock-heating or small perihelion orbits, and they provide an indication of terrestrial age (1-4). In a recent study of 172 meteorites collected during the 1985 season, Lewis Cliff meteorites were found to tend towards lower TL levels compared with those collected at the Allan Hills, inferring a greater proportion of large terrestrial ages for the former site (5).

We now report data for 58 meteorites collected from Lewis Cliff during the 1986 season. The measurements were made in the manner described in Ref. 1. The distribution of natural TL for the 1986 collection is significantly different from the earlier data for the site, having a greater proportion of larger values. The TL sensitivity data for the two years is also different, the 1986 data showing a sharp peak in the histogram at 0.5 (Dhajala = 1) suggesting that the 1986 collection contains a number of paired meteorites. These data are related to field relationships, in that the 1986 samples were collected further down field as the ice tongue is systematically searched south to north. There may be a systematic change in terrestrial age along the ice tongue. Additionally, several of the 1986 samples were collected from a gully to the east of the tongue, and these may be paired. It is clear that there are variations in natural TL with location on the ice which are related to pairing and possibly the accumulation mechanism. Further study of the present data and, importantly, a completion of the sampling at the site, will surely yield new information on the accumulation mechanism as well as identify unusual meteorites.

Grant support: NASA grant NAG 9-81, NSF grant DPP-8613998. Field work supported by NSF grant DPP-8314496. References: (1) Hasan *et al.* (1987) *J. Geophys. Res.* **92**, E703. (2) Sears and Hasan (1986) *LPI Tech. Rept.* **86-01**, 83-100. (3) McKeever and Sears (1980) *Mod. Geol.* **7**, 137. (4) McKeever (1982) *EPSL* **58**, 419. (5) Hasan and Sears (1988) *LPSC* **19**, 457. (6) Hasan *et al.* (1988) *Smith. Cont. Earth Sci.*, (submitted).