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Ice movement, pairing and meteorite showers of ordinary chondrites from the Allan Hills. P. H. Benoit, H. Sears, and D. W. G. Sears. Cosmochemistry Group, Dept. of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR 72701, USA.

Almost two thousand meteorites have been returned from the Allan Hills region of Antarctica in the last decade or so (1). Since 1987, as part of the initial characterization of these meteorites, we have conducted a routine thermoluminescence (TL) survey of all returned samples large enough (>20 g) for the technique (2, 3) and we have also recently measured 50 EUROMET samples. We report here conclusions based on TL data for 161 meteorites from the Main, Far Western (FW) and Near Western (NW) ice fields at the Allan Hills.

We have investigated the degree of pairing in this dataset using fairly conservative criteria based on petrographic descriptions, find location, and natural and induced TL. We have identified 33 pairing groups (with 2–5 members), suggesting that our dataset contains a maximum of 123 individual meteorites.

The natural TL of meteorites from the Main field is generally low (5–30 krad), in agreement with the high terrestrial age for this field (4). The natural TL of meteorites from the NW and FW are, however, generally high (30–80 krad) in agreement with Huss' suggestion, based on meteorite concentrations, that these fields are much younger than the Main field (5). At all three fields there is a tendency for meteorites with low natural TL to be found down ice, suggesting that the Whillans-Cassidy mechanism for meteorite concentration is applicable to individual icefields as well as on a regional scale.

The induced TL sensitivity of the Allan Hills meteorites is generally lower than that of non-Antarctic falls which is either largely or wholly the effect of weathering (6). The induced TL peak temperature-width data of H-chondrites, which are not affected by weathering, show a broad range in temperature which differs significantly from the non-Antarctic falls and portions of the Lewis Cliff field (7). This suggests that at least a portion of the older Antarctic meteorites have experienced different thermal histories than younger Antarctic meteorites and modern falls as was noted earlier (8).

The 1988–89 German-American expedition (9) discovered a number of meteorites in a previously barren area along the escarpment west of the major meteorite concentration at the Main field. Ten of these are H5-6 chondrites ([ALH88026, 88030, 88033, 88035], [88029, 88042], [88018, 88042], 88016, 88017) with atypically high (>100 krad) natural TL. Although our conservative pairing criteria separate these meteorites into three pairing groups and two unpaired samples, we think it likely that all ten are actually paired. This group is noteworthy for its extremely high natural TL, higher than most non-Antarctic falls. The fairly high degree of weathering indicates that the group is a not a modern fall but its high natural TL and the number of fragments indicates that it is certainly younger than most Antarctic meteorites. The shower must have experienced an unusual radiation history to have originally acquired such high natural TL levels. Supported by NASA grant 9-81 and NSF grant DPP8817569. References: (1) Schutt (1990) *LPI Tech. Rep.* 90–03. (2) Score and Lindstrom (1990) *Ant. Met. Newsletter,* **13.** (3) Benoit *et al.* (1990) *Ant. Met. Newsletter,* **13,** 20. (4) Nishiizumi *et al.* (1989) *EPSL* **93,** 299. (5) Huss (1990) *Meteoritics* **25,** 41. (6) Benoit *et al., Meteoritics,* in press. (7) Benoit *et al.* (this meeting). (8) Haq *et al.* (1988) *GCA* **52,** 1679. (9) EUROMET, *LPSC* **22,** 359.