Comparison of US Antarctic meteorite collection to other cold and hot deserts and modern falls.

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Introduction: The US Antarctic meteorite collection has grown close to 18,000 specimens, over 16,000 of which have been classified. Because of this growth, the parallel growth of Antarctic meteorite collections by Japan and China, and also the hot desert collections (from Africa and Australia), we will update the statistical overview of the US collection (last done in 1990 [1]), and make comparisons to other collections and modern falls.

Collections: The US Antarctic meteorite program has completed the characterization of 30 different field seasons of samples (1976 to 2006). This milestone seems to be a logical point to update collection statistics for the ~16000 classified samples. The Japanese NIPR collection included 15741 meteorites as of 2006 [2]. The classification emphasis has been on non-ordinary chondrites, thus allowing comparison of these groups to non-ordinary chondrites in other collections. The Chinese Antarctic meteorite program (CHINARE) has grown to close to 10,000 specimens with nearly 2500 classified so far [3]. The last decade has seen a huge increase in the numbers of meteorites received from hot deserts (Table 1), including North Africa and Australia.

Results: Several issues will be addressed, and have been discussed previously. First, [6] suggested that the higher abundance of HED meteorites among modern falls may indicate that the flux of HEDs to Earth has increased more recently, The occurrence of HEDs among the other collections is low and would lend support to this idea. Second, the lack of irons in the hot deserts and Antarctic collections (noted by [6]) is in contrast to the modern falls (~5%). Iron meteorites are extremely rare and frequently of ungrouped types. Third, CM carbonaceous chondrites are strangely abundant in Antarctic collections, but nearly absent in hot deserts (<1% of all carbonaceous chondrites compared to ~ 50% of Antarctic). A good explanation for this abundance remains elusive. And fourth, although R chondrites are generally becoming more abundant in all of these collections, they remain most dominant in the hot desert collections, with very few coming any of the Antarctic localities

Table 1: comparison of % of numbers of meteorite groups

	ANSMET	NIPR	CHINARE	Hot Des.	Falls
N	16087	15741	2468	5768	1005
Ref.	[4]	[2]	[3],[4]	[4],[7]	[4]
Achon	3	4	2.4	7.7	7.7
Irons	0.7	0.16	0.04	0.7	4.8
C	3.2	1.9	0.8	4.1	4.1
R	0.13	0.03	0.2	0.8	0.1
All OC	92.2	93	96.6	82.9	81.3
HED	1.7	2.8	1.5	3.8	5.5

References: [1] Ant. Met. Newsl. vol. 13, no 1, 1990; [2] Kojima, H. (2006) Geol. Soc. Lond. Sp. Publ. 256, 291-303. [3] Liu et al. (2004) Chin. J. Astron. Astrophys. 4, 166-175. paper; [4] Meteoritical Bulletin Database, accessed May 2010; [5] Grady, M.M. (2000) Catalogue of Meteorites, 5th Ed., Cambr. Univ. Press; [6] Cassidy, W.A. (2003) Meteorites, Ice and Antarctica. Cambr. Univ. Press; [7] Bevan, A. (2006) Geol. Soc. Lond. Sp. Publ. 256, 325-343.