Confirmation of the Younger Dryas boundary (YDB) data at Murray Springs, AZ

We are pleased that Haynes et al. (1) have verified our discovery of a 12.9-ka peak in magnetic grains from the Clovis-age surface (YDB) at the Murray Springs site (2) that is even higher (8.2 g/kg) than we reported (2.6 g/kg), consistent with variable deposition. Haynes et al. (1) also reported much larger microspherule concentrations in the YDB, up to 37,000/kg, compared with 109/kg that we found in bulk sediment. Their elemental analysis of magnetic grains is similar to ours with comparable concentrations (Table 1). They also found microspherules and magnetic grains with Ti concentrations as high as 5.1%, which is much higher than crustal abundance (0.38%) or typical meteoritic values (<0.06%) (3), just as we did. This composition counters the argument of Pinter and Ishman (4) that YDB microspherules are typical meteoritic ablation products.

We are puzzled by the conclusion of Haynes et al. (1) that they "failed to find iridium or radiation anomalies." We reported radiation levels in the Murray Springs YDB ≈20% higher than background (2), and Haynes et al. (1) also detected radiation peaks at four Clovis excavations that were 23–68% above background in or near the YDB. They reported extremely high concentrations of Ir ranging from 31 to 64 ppb in two magnetic fractions from across the YDB. Their values are as much as 34 times higher than we reported but within the range of values at other YDB sites and >1,000 times terrestrial abundance (0.021 ppb) (3). These Ir measurements contradict those of Paquay et al. (5), who failed to observe large Ir anomalies at Murray Springs.

Haynes et al. (1) measured 72 ppb Ir in Curry Draw streambed magnetic grains, which they assumed were background material, although this value is much higher than terrestrial abundance and remarkably similar to their Murray Springs YDB values. It seems that the sample may be Ir-rich YDB material that was redeposited during streambed erosion. The low Ir values for Tucson roof particles are most likely anthropogenic terrestrial material, which Haynes et al. (1) concede. Our interpretations may differ, but the data of Haynes et al. (1) confirm our findings and are a useful contribution to the YDB debate.

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Table 1. Comparison of Murray Springs analyses

	Haynes et al. (1)		
Elem	26MS07	3-5MS07	Firestone et al. (2)
Fe, %	27	6	21
Ti, %	2	5	16
Ni	67	28	40
La	38	347	96
Nd	27	225	110
Sm	5	35	15
Eu		1	2
Gd	5	34	18
Tb	0.4	5	4.6
Yb		21	13
Lu	7	5	1.8
U	3	8	7.6

Concentrations in ppm.

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