STREAMS OF H4-6 CHONDRITE FALLS: A PROGRESS REPORT. R. T. Dodd (Department of Earth and Space Sciences, State University of New York at Stony Brook, NY 11794), S. F. Wolf (Argonne National Laboratory, Argonne, IL 60439), M.-S. Wang and M. E. Lipschutz (Department of Chemistry, Purdue University, W. Lafayette, IN 47907).

In an earlier work [1], we reported that, from their circumstances of fall, a group of 17 H chondrites ("H Cluster 1") which fall in May over the 40-year period 1855-1895 seem to have a coorbital origin as members of a putative meteoroid stream. Contents of thermally labile trace elements determined by RNAA and treated by multivariate statistical techniques in 13 members of H Cluster 1 prove to be readily distinguishable compositionally from 45 other H4-6 chondrite falls [1]. Thus, a group of meteorites distinguishable by one criterion - similar fall dynamics - proves to be distinguishable from an otherwise similar suite of falls by another criterion - contents of labile trace elements, suggesting a distinguishable, genetic thermal history. Here, we report our progress on an analogous study of additional H4-6 chondrite falls that may sample as many as 4 other putative meteoroid streams.

The period between days 224 and 297 (1 January = Day 1) includes several recent fireballs and near-Earth asteroids whose similar orbital parameters suggest that they sample several asteroid/meteoroid streams [2,3]. A year-day diagram for H chondrite falls during that interval (Figure 1) suggests that these may derive from several - perhaps as many as four - clusters most of which have yielded recent falls and thus may record on-going stream encounters.

Figure 1 suggests and, using the approach described earlier [1], Table 1 confirms that H5 and H6 chondrites seem to be distributed non-randomly. Although random analogues commonly match or exceed the observed maximum cell contents ($n_{max} > 0.05$), they typically include more isolated (n = 1) cells than are observed.

		Cell contents					Random sets		
Type	N	Cell	1	2	3	4	$f(n_{max})$	f(n=1)	f(both)
H5	21	30y x 5d	11	8	2	-	0.56	0.014	0.014
H5	21	40y x 5d	11	6	4	-	0.64	0.048	0.042
H6	15	30y x 10d	7	8	-	-	1.00	0.046	0.046
H6	15	50y x 10d	6	6	2	1	0.35	0.108	0.044

Table 1. Observed versus random distributions of H falls since 1850. Five hundred random data sets were generated and sampled, using the procedure of Dodd *et al.* [1].

Figures 2 and 3 show that the distributions of these two types are almost complementary. A diagonal cluster of H6 falls (H Cluster 4 in Fig. 3) fills a conspicuous hole in the H5 distribution (Fig. 2). The Peekskill meteorite (PKS) lies within 1σ of a least-squares line through H Cluster 4 and appears to belong to it. Although a striking concentration of early 18th century falls is aligned with H Cluster 4, it may not be related to H Cluster 4 and we designate it as H Cluster 3 in Figure 2.

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We obtained samples of the 25 falls comprising H Clusters 2-4 - i.e. 9, 5 and 11 chondrites, respectively and have used RNAA to determine contents of the 10 thermally-labile trace elements (Rb, Ag, Se, Cs, Te, Zn, Cd, Bi, Tl, In) and a few others (Au, Co, Sb and Ga) in them. We have not yet obtained a sufficient number of H Cluster 5 falls for study and are postponing work on this suite. H Cluster 5 includes the Coleman MI fall of 21 Oct. 1994 (COL in Figs. 1 and 2) from which, unfortunately, material has not and may not become available for scientific study.

The data for the 25 samples of H Clusters 2-5 are now being evaluated by our multivariate statistical techniques. We will report those data available at the time of LPSC XXVI.

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REFERENCES

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[2] Halliday I. *et al.* (1990) *Meteoritics*, *25*, 93.
[3] Drummond J. (1991) *Icarus*, *89*, 14.

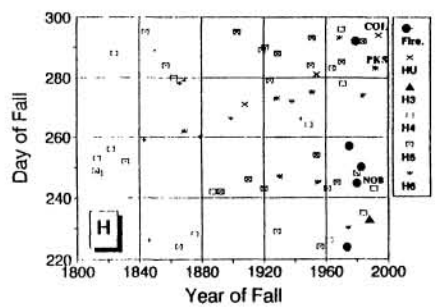

Fig. 1. Fireballs and H3-6 chondrite falls from days 220-300 (8 Aug. 27 Oct.) during the 1800-1994 time period. The data hint at non-random distributions and 3 recent falls - Noblesville (NOB), Peekskill (PKS) and Coleman (COL) - seem to lie on extensions of trends for earlier falls.

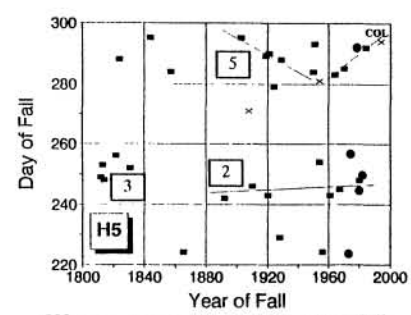

Fig. 2. Fireballs and H5 chondrite falls during the same time period as in Fig. 1. Three putative streams - H Clusters 2, 3 and 5 - are indicated.

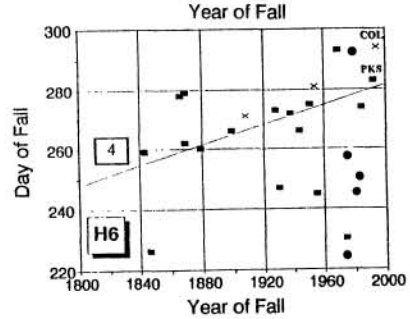

Fig. 3. Fireballs and H6 chondrite falls during the same time periods as in Figs. 1 and 2. The least-squares line defining H Cluster 4 could be extended to include H Cluster 3, all of which are H5 chondrites.