

## 35. Cometary vs Asteroidal Origin of Chondritic Meteorites (Abstract)\*

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*Monte Carlo calculations indicate excellent agreement between observed and predicted orbits of Prairie network fireballs, if it is assumed that fireballs are derived from remnants of short period comets of Jupiter's family. No such satisfactory agreement has been found for any other proposed source. The distribution of radiants and time of fall observed for chondrites will also be reproduced by this source, provided that consideration is given to the fact that the Earth's atmosphere will permit low velocity bodies to survive but will destroy high velocity bodies. Again, no other proposed source has been found to be adequate.*

*It now appears likely that the mean lifetime of chondrites is limited to  $\sim 10^7$  yr by the high probability of complete fragmentation following impact by smaller bodies. This improves the agreement between the observed cosmic ray exposure ages and those predicted for a cometary source. This also requires some modification of the earlier discussions of alternative sources, but does not result in them becoming more satisfactory.*

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\* The complete paper has been published in *Physical Studies of the Minor Planets*, NASA SP-267, edited by Tom Gehrels, pp. 447-460, 1971.