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Shadow-Casting Meteors

THE fall of a brilliant meteor is one of the most awe-inspiring of natural phenomena. Aviators have banked their planes, cars have been driven nearly into the ditch, and pedestrians have run to dodge a meteor more than fifty miles away. Closer to the real end point, the light and detonations have stampeded farm animals.

From the considerable number of meteors reported in Iowa alone during the latter half of 1951, we have selected as shadow-casting and as probably dropping meteorites the following: (a) July 28, ending near Centerville—detonations fifty miles back along the path; (b) August 30, ending near Creston—detonations; (c) November 7, ending near Norman, Oklahoma—daylight, detonations eighty miles back along the path; (d) November 9, ending near Red Oak, Iowa—drivers of cars were startled by sudden lighting of the surrounding landscape (reported from Indiana to Nebraska).

Let us examine some typical first reports on a shadow-casting meteor. A woman reported that she had seen a ball of fire fall through a tree in her neighbor's yard in Omaha, Nebraska; at the same time men reported that they had seen a flaming airplane fall into Lake Michigan at Milwaukee. A meteor worker analyzing these reports would assume that the meteor, which must have ended at a height of several miles, was at least 50, but probably not more than 400, miles from Omaha, and a comparable distance from Milwaukee. Hence the meteor might have fallen in Wisconsin, Minnesota, Illinois, Iowa, or Missouri.

Let us assume, however, that an Omaha resident with scientific training had heard the lady's report over a radio station and had promptly called her by telephone. He could have found out in two or three minutes that the meteor fell roughly due east of

Omaha, that it deviated from south toward north as it fell, and that the path made an angle of less than 45° with the horizon. A trained resident of Milwaukee could have discovered just as quickly that the meteor fell south-southwest of Milwaukee, that it deviated from south toward west as it fell, and that the path made an angle of more than 45° with the horizon. From these simple facts anyone with a map of the region could have located the meteor fairly closely by drawing lines eastward from Omaha and south-southwestward from Milwaukee. The intersection of these lines would have been close to the real end point of the meteor.

Approximately a hundred meteors large enough to drop meteorites fall in the United States each year, but only one or two recoveries of freshly fallen meteorites are recorded annually. To increase the number of recoveries we suggest that scientists emphasize in teaching and in conversation that a person's guess on the actual height and distance of an unfamiliar object is worthless. Let each scientist use his influence to make the press stories from his area include the direction of the fall. For each 250,000 square miles there should be two or three persons sufficiently alert and so situated as to obtain the direction of a brilliant meteor from two or more well-separated points and thus to give the real location. Finally, let geologists become reasonably familiar with the characteristics of meteorite falls. From the stories of recovery of supposed meteorites following the fall of a brilliant meteor, one could soon differentiate with some confidence between the genuine meteorites and most "meteorongs," even before the stones are seen. The probability of greater recoveries makes such a project of public education worth the effort.

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