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Subj: Anomalous Luminous Phenomena (Seventh Report) May 23, 1950

(6) In the case of genuine meteors the paths are directed toward all points of the compass with equal frequency. On the contrary in the case of the green fireballs, plots of admissible approach sectors show that there is a very pronounced tendency for the paths to come in from the north half of the sky.

(7) The three groups of anomalous greenish luminous phenomena show a curious association with well known meteor showers, although none of these meteor showers normally produce extremely bright green fireballs, such as those recently observed. For example, the observation mentioned by Mr. Monnig appeared near the maximum of the Quadrantid shower of early January, Mr. McCullough's observation of August was near the time of the Persid shower and the December observations all fell in the interval covered by the Geminid shower. This relationship might indicate an attempt to render the green fireballs less conspicuous by causing them to appear only when there is considerable meteoric activity.

(8) As noted in an earlier communication, the remarkably vivid green color reported for most of the December fireballs is rarely observed in the case of genuine meteors. By laboratory test this peculiar color seems to be identical with that given off by copper salts in the blowpipe flame. If this identification is correct, the wave length of the radiation from the green fireballs is near $\lambda = 5218\text{\AA}$.

(9) The duration estimates of between 2 and 3 seconds reported for the green fireballs are considerably longer than those (0.4 - 0.5 seconds) for the ordinary visual meteors, but shorter than the duration estimates invariably reported in the case of a genuine meteorite fall (5 to 30 seconds or even longer).

(10) For none of the green fireballs has a train of sparks or a dust cloud been reported. This contrasts sharply with the behavior noted in case of meteoric fireballs--particularly those that penetrate to the very low levels where the green fireball of December 12 was observed.

2. In the year and a half since this list was prepared, many additional observations have been made, the total number of objects now accepted as belonging in the green fireball category being 72. (Although this number constitutes nearly 50% of the incidents listed in the accompanying Summary, it constitutes less than 5% of the total number of unscreened observations reported to the writer.) Critical analysis of all green fireball reports now available shows that only one of the statements in the list given in paragraph 1 needs to be modified, namely, item (1). Within the last year, a considerable number of the green fireballs have appeared to fall vertically downward rather than

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