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ground is well constituted or possesses an extensive network of conducting elements (water pipes, telephone and electric cables, etc.)

It follows that the lightning flash will be observed more frequently at those relatively high points than elsewhere, and hence probably that "ball lightning" will appear to develop quite commonly at such points.

Brush discharges tend to form at sharply cornered extraneousities of objects, and along themselves in the direction of the potential gradient. Well-rounded and conducting objects would generally receive preference. These considerations apply to cases which were classified by the Japanese as "ball lightning" but actually were cases of St. Elmo's fire (bright glow or brush discharges).

There have been reports by observers of "ball lightning" to the effect that the phenomenon appeared to float through a room or other space for a brief interval of time without making contact with or being attracted by objects. Helmer and Sherman¹ have published a reproduction of moving film camera photographs of unusual discharges during thunderstorms. In the case of the phenomenon observed at Santa Fe, New Mexico (elevation 7000 feet) on the night of September 5, 1935, these authors state: "The cameras were mounted rigidly on a bench in a portable laboratory. The discharge was probably about 200 feet from the cameras, although the exact distance is not known since no standard indicator with this flash could be distinguished from the general background of thunder. The discharge appeared within less than one-thirtieth of a second after an intense cloud ground stroke not shown on this portion of the film. Analysis of the photographs indicates that the discharge consisted of at least four luminous darts moving with a projected velocity of the order of 300 m/sec. The most notable features of this discharge are: (1) its irregularity of path and rapid reversals in direction, (2) its proximity to ground objects with no apparent contact with the ground, (3) the beaded nature of the path, and (4) the progress of the discharge in two directions from a single point."

Note should be made of the fact that the luminous darts did not appear to be attracted to available ground objects even though they were in the vicinity of the ground. On this basis it cannot be stated whether there are any definite objects to which all cases of "ball lightning" would be attracted. We should think that sharp-pointed, grounded objects are most likely to attract "ball lightning."

1. Helmer, E. E., and Sherman, E. J., Jour. of Applied Physics, vol. 10, p. 699 (1939).