GENERAL NOTES.

A Central Eclipse of the Sun will occur on December 23, but will be invisible in the Northern Hemisphere. It will be annular at the beginning and end and will be total in the middle. The path of the central line of eclipse will pass across South America, crossing Chili, Argentine Republic and Uraguay, perhaps touching a corner of Brazil. Thence its course will be wholly over the waters of the southern Atlantic and Indian Oceans. The duration of totality will be only eleven seconds at the most. As a partial eclipse the beginning may be observed all along the southeast coast of South America from the mouth of the Amazon down, in the southern point of Africa and the Island of Madagascar. For the elements of the eclipse see POPULAR ASTRONOMY No. 151, January 1908, page 48.

Photographic Observations of Comet Morehouse. Beginning with the night of October second Comet Morehouse has been photographed here on every clear evening; these photographs have been made with a photographic doublet of nine inches aperture, with a ratio of aperture to focal length of 1 to 5, which has been recently installed in the observatory here.

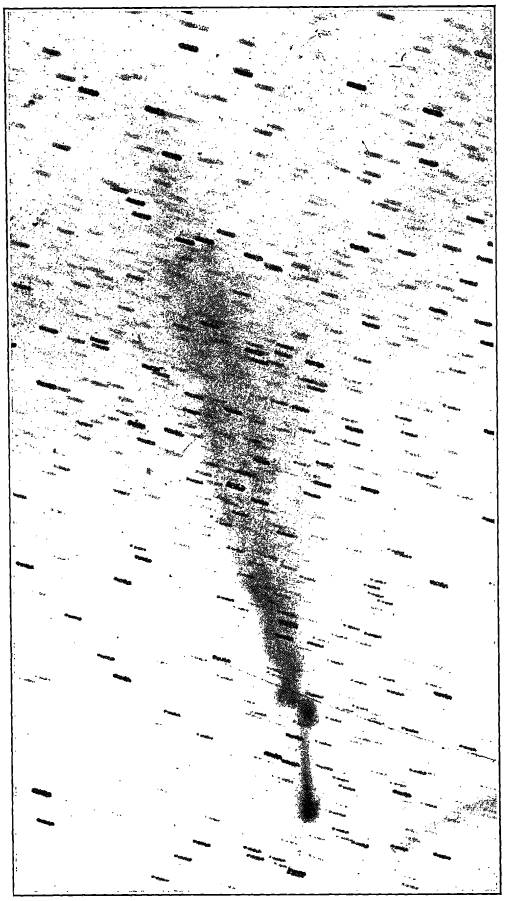
The instrument was built by the John A. Brashear Company and is a part of the astronomical equipment presented by William C. Sprove to Swarthmore College.

This comet has been whimsical in its behavior, so much so, that, one could not predict with any degree of confidence what, on any one night, the shape of its tail might prove to be.

A most striking change occurred during the twenty-four hours beginning at eight o'clock Washington mean time October fourteenth. A photograph made on the night of the fourteenth showed the comet with a quasi fan-shaped tail. It was not symmetrical, but was much brighter on one side, and there issued from the head and seemingly from various parts of the tail long, thin, straight, and nearly parallel rays. The appearance of the tail on the night of October 15 is well shown in a photograph, the negative of which I exposed from 7:00 to 8:30 o'clock Washington Mean time. I exposed a second plate on the same night from 9:20 to 10:20. Both plates showed the straight narrow tail joined to the head of the comet as well as the long broad irregular ribbon-like tail the beginning of which was at some distance from the head of the comet. The first negative, which was exposed longer and which was made when the altitude of the comet was greater showed thin straight rays apparently issuing from points in the comet's tail, resembling somewhat those of the night before. A comparison of the two plates showed that the beginning of the tail (*i. e.* the part nearest the head of the comet) was moving faster among the stars than the straight tail that was joined to the head of the comet.

At the beginning of the broad tail, I selected two condensations, the one on that side of the tail which was in the direction in which the comet was moving, I called condensation one, and the other at nearly the same distance from the head but on the opposite side of the tail I called condensation two. These condensations are easily identified on both plates. Both were farther from the head on the second plate than on the first, the first having moved a distance of 5′ 45″.5 of arc and the second a distance of 5′ 34″.

On the night of the sixteenth Mr. Walter R. Marriott exposed a plate for one and one half hours beginning at seven thirty. The condensations were found on this plate, though owing to the fact that they had changed their shape somewhat they could not be so certainly identified as on the preceding night. Condensation one on this plate was 1° 17′ 47″ farther from the head than it was on the first plate exposed on the fifteenth and condensation two had moved in the same time through an arc of 1° 16′.



COMET MOREHOUSE.
October 15.

No traces of the condensations, nor of any part of the broad ribbon-like tail could be found on a plate exposed on the seventeenth.

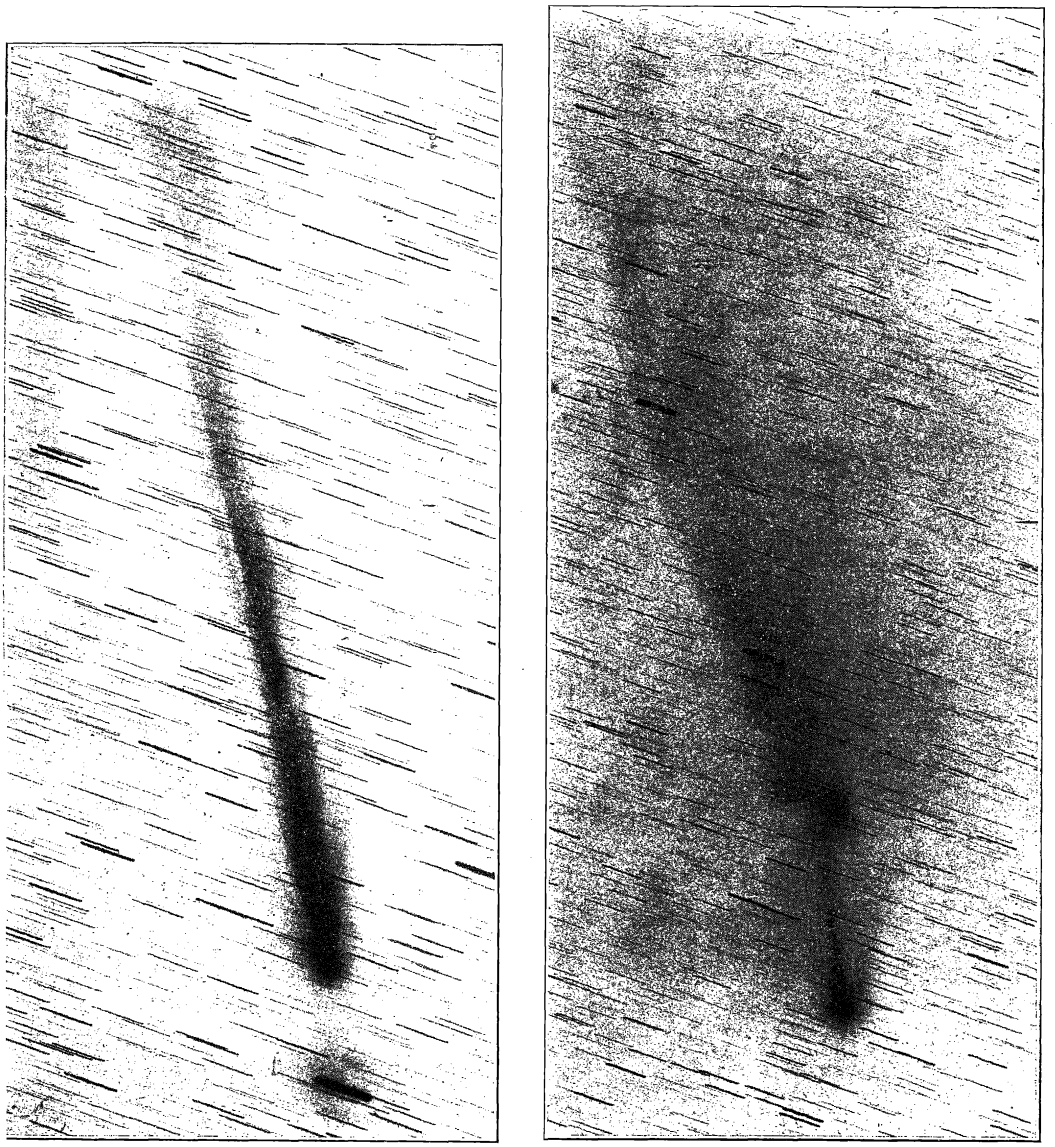
If we assume that the tail of the comet is in the direction of the radius vector of the comet from the Sun, condensation one had receded from the head of the comet, 224,000 miles, and condensation two about 247,000 miles in two and one half hours on the night of the fifteenth. This requires an average velocity of 89,600 and 99,000 miles per hour respectively.

A comparsion of the first plate of the fifteenth with that of the sixteenth

shows that the average velocity of the two condensations for 24½ hours was 142,000 and 129,000 miles per hour respectively.

It is probable that the tail of the comet deviates enough from the radius vector, to modify slightly these velocities.

Swarthmore, Pa. JOHN A. MILLER.



. 1, Oct. 14, '08, exposed $7^h\ 44^m$ to $9^h\ 46^m$ E.S.T. No. 2, Oct. 15, '08, exposed $8^h\ 0^m$ to $9^h\ 30^m$ E.S.T.
COMET MOREHOUSE PHOTOGRAPHED BY REV. JOEL H. METCALF.