

18. There seems to be reasonably clear evidence that this and similar globular clusters are very distant systems, distinct from our galaxy and perhaps not greatly inferior to it in size. The open clusters, on the other hand, seem to be relatively small parts of the local system; but further observation is necessary to make certain of this deduction.

In conclusion it may be stated that since the completion of the work on Messier 13 similar but less extensive studies have been made of six other globular clusters and of two open groups. The results from the globular clusters, so far as they have been analyzed, are in good agreement with those summarized above for Messier 13. The presence of blue stars and the absence of exceptionally large color-indices indicate that the effectiveness of interstellar media as light scattering agents is very slight. In particular, the phenomenon of decreasing color-index with decreasing brightness holds for such clusters as Messier 3, 5, and 15, and is very probably a general characteristic of all globular systems. August 1916.

A LUMINOUS OBJECT SEEN ON MAY 4, 1916.

BY C. D. PERRINE.

About 9^h 10^m in the evening of May 4th (Córdoba mean time) Dr. Glancy called my attention to a peculiar object in the southeastern sky.

It was then a bright streak just below α *Pavonis*, sensibly straight, about 8° or 10° long and one-half to one degree in width. It was more sharply defined toward the west, that extremity resembling the head of a large bright comet, but without any well defined condensation or nucleus. In general appearance to the naked eye and with the exception of a changed position it was an exact counterpart on a smaller scale of Halley's comet when this object was near to the Earth and its head near enough to the horizon to suffer greatly by absorption from the atmosphere.

After a few minutes' examination with field glasses a series of pointings was made as long as it could be seen with

the finder of the 12-inch equatorial. These pointings were upon the western end of the object with respect to terrestrial objects, or the eastern end with respect to the stars.

These observations are as follows:

Córdoba Mean Time	R. A.	Decl.	Remarks
8 ^h 52 ^m	20 ^h 18 ^m .5	—57°	Casually observed and set down from memory.
9 34	21 02 .3	—55 .8	3 pointings.
9 46	21 21 .2	—55 .5	2 pointings.
9 58	21 27	—55 ¼	1 pointing, very uncertain.

The first observation was made by Dr. Glancy; the last three by Dr. Perrine.

When first seen (estimated to be at 8^h 52^m ± 2^m) by Dr. Glancy, the western extremity of the object was in apparent coincidence with the 2d magnitude star α *Pavonis*. It was soon seen that it was approaching the horizon and would shortly be lost to view—the diurnal motion not sufficiently counteracting its own motion.

In the intervals between pointings it was studied with field-glasses and with the naked eye. It grew fainter as it approached the horizon. After it had disappeared a low-lying bank of haze or cloud was observed at that point. During the earlier stages of its apparition there seemed few or no signs of streamers which are often observable in the tails of comets. At about the middle of its period of visibility when it had grown perceptibly fainter the portion midway looked, with field-glasses, like the main streamer of the middle portion of a comet's tail. It retained its rectilinear form as long as it could be seen.

There were no clouds, with the possible exception mentioned above, in any part of the sky at any time during the apparition of this object nor at any time during the night in question so far as I know. The sky was of its usual transparency and work was in progress with the astrographic telescope (on chart plates) and with the meridian circle as well as earlier with the 12-inch equatorial with which Dr. Glancy observed Neujmin's comet.

The appearance of the object was not that of an ordinary aqueous cloud. I think there can be no doubt that it was a self-luminous object.

There were no means of photographing it or of examining its spectrum in the short time available.

Upon plotting the observed pointings including the estimated position by Dr. Glancy at 8^h 52^m it is found that they all appear to fall upon a great circle passing thru the Sun within their probable errors. The observed motion was 10° on a great circle toward the Sun in the interval of one hour.

Explanations of the nature of this object seem to be limited by the circumstances to two:—*a*, that it was a comet traveling very close to the Earth and toward the Sun or *b*, that it was the cloud left by a meteor.

The appearance is better explained by the assumption that it was a comet. There were no changes of form such as usually occur in meteor clouds—the object was sensibly straight and streamer-like thruout its entire apparition. The extremity nearest the Sun's place was as sharply defined as, and similar in shape to, the head of a large comet close to the Earth, while the opposite portion faded out gradually like the tail of a comet. There was no pronounced condensation and so far as I could determine no nucleus altho one stellar object of approximately sixth magnitude was suspected to have motion. It was not possible under the circumstances, however, to verify the fact. The axis of the object was at first nearly parallel to the horizon, but later became more inclined, the west (terrestrial) end being nearest the horizon.

The tremendous geocentric motion demanded, while not impossible, would be, nevertheless, very unusual.

Some time after the apparition of this object several meteors were noticed, one at least of which was visible in the southeastern sky, coming from a radiant to the north and perhaps 30° or 40° above the horizon.

The observed motion extrapolated would have carried the object almost to the Sun's place at sunrise. There seemed a possibility, however, that it might slow up and that it would be visible before sunrise. It was therefore, carefully looked for, in a good sky, but nothing seen of it.

Considering all the circumstances, particularly that its motion would carry it rapidly into the northern sky if it were

a comet, it was deemed best to warn northern observers. Hence the following telegram was sent to Harvard College Observatory:

May 5, 1916.

Bright object visible here last night nine to ten. Moved from *alpha Pavonis* ten degrees toward Sun's place. Tail. Possibly a comet.

It is not considered, however, that its nature can be established without observations from other points. Requests for observations were sent to the newspapers but no reports have been received.

Dr. Glancy has investigated the question of an orbit for the positions, which is also interesting from a theoretical standpoint on account of the possibility of such a close approach, and her results follow.

Observatorio Nacional Argentino,
Córdoba, June 16, 1916.

A LUMINOUS OBJECT SUSPECTED TO BE A COMET.

BY A. ESTELLE GLANCY.

On the evening of May 4th an object resembling a comet with a long straight tail was seen at Córdoba in the southeast near *a Pavonis*, (see the preceding note by Dr. Perrine). The tail pointed away from the Sun; the motion was directed toward the Sun. Three observations within an interval of an hour showed a motion of 10° on a great circle. Theoretically such an arc might be made to yield some sort of an orbit, and it is interesting to study what can be derived mathematically.

Following are the three observations, by Dr. Perrine and the writer, the middle one unfortunately close to the third, and the first one a casual naked-eye note of the position.

Gr. M. T.	R. A.	Decl.
May 4.548	20 ^h 18 ^m .5	—57°.0
May 4.577	21 02 .3	—55 .8
May 4.585	21 21 .2	—55 .5
(Uncorrected for parallax.)		