Mr. J. Evershed,

The Transit of Halley’s Comet across the Sun.
By J. Evershed.

The following programme was arranged at the Kodaikánal Observatory for the observation of the transit.

1. A careful scrutiny of the Sun’s disk by direct observation with high powers, using the 6-inch Lerebour et Secretan refractor.

2. A series of direct photographs to be taken with varying exposures and slow plates, on a scale of 8 inches to the Sun’s diameter.

3. A series of monochromatic photographs to be taken with the spectroheliograph, the camera slit being set on the head of the cyanogen fluting at λ 3883.

4. A series of monochromatic photographs to be taken with the camera slit set on the line K, for comparison with the others.

5. At the time of mid-transit some photographs were to be taken with the large grating spectrograph of the cyanogen bands at 3871 and 3883, observing at the same time the region of the blue “Swan” band.

Had the sky been clear, it was intended to begin the cyanogen photographs before ingress and to continue after egress, in the hope that with very long exposures the comet might appear as a bright object outside the Sun’s limb. During the time of transit, exposures of about 30 seconds total duration would have sufficed to give good images of the disk, and the comet was expected to appear on these as a dark absorption marking, as is the case with many of the solar prominences.

I had great hopes of the success of these monochromatic plates, because of the very great intensity of the cyanogen radiations in the comet’s head as revealed by the spectrum plates.

The time of ingress as communicated to us beforehand was 7h 51m ± Indian standard time, and egress one hour later. Although clear skies are the rule in the early mornings at Kodaikánal, and had prevailed since January, the morning of May 19 was cloudy. At 8 a.m. there was a momentary gleam of sun, which enabled us to adjust instruments. At 8h 30m the clouds had thickened, and all hope of obtaining successful photographs was abandoned. But at about this time a cable message came through from Kiel which stated that ingress would not take place until 8h 59m. This information, so opportunely received, saved the situation, as there occurred several moderately clear intervals between 9h and 10h, when it was possible to partly carry out the programme as regards items 1, 2, and 3. At no time was the Sun entirely free from cloud, and the intervals of moderate clearness were few. As a compensation, the definition, which is usually very poor after 9 a.m., remained good. No long-exposure plates before ingress or after egress were attempted on account of the thick clouds surrounding the Sun.

Results.—No trace of the comet can be seen on any of the direct photographs which were obtained, and Professor Michie Smith
could see nothing whatever of an unusual nature on the Sun's disk with the 6-inch telescope, although he states that the definition during the partially clear intervals was excellent.

Eight monochromatic photographs of the disk in the cyanogen radiation 383 were obtained at the following times:

<table>
<thead>
<tr>
<th>No. of Plate</th>
<th>I.S.T.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>794</td>
<td>8 59</td>
<td>Fair.</td>
</tr>
<tr>
<td>796</td>
<td>9 32</td>
<td></td>
</tr>
<tr>
<td>797</td>
<td>9 35</td>
<td>Poor, much cloud.</td>
</tr>
<tr>
<td>798</td>
<td>9 38</td>
<td>Fair, good definition of details.</td>
</tr>
<tr>
<td>799</td>
<td>9 56</td>
<td>&quot;</td>
</tr>
<tr>
<td>800</td>
<td>9 59</td>
<td>Poor, much cloud.</td>
</tr>
<tr>
<td>801</td>
<td>10 02</td>
<td>Very poor and under-exposed.</td>
</tr>
<tr>
<td>802</td>
<td>10 19</td>
<td>Good.</td>
</tr>
</tbody>
</table>

All the plates are much streaked with cloud, but Nos. 796, 798, 799, and 802 are otherwise good, and show much minute detail all over the disk. If the times of ingress and egress transmitted to us from Kiel are not greatly in error, the comet should appear on the three plates Nos. 796, 798, and 799. A preliminary examination gives a negative result; and if the comet nucleus is shown at all, it must be too small or faint to be readily distinguished from the innumerable small markings, both dark and light, shown in all parts of the disk. On the other hand, the cyanogen part of the comet may be too large and diffuse to appear as a definite dark marking. The head of the comet emitting the cyanogen rays must have been larger than the Sun's disk, and it is probable that a more or less uniform dimming of the entire disk would escape notice, especially under such cloudy conditions.

Plate No. 802 is perhaps the best of the series, but it was exposed about 20 minutes after egress: this photograph does show a small dark spot, unlike a defect in the film, at 7°6 north from the centre, in position angle 16° towards the east. The spot is about 7" in diameter, and is quite opaque, but has ill-defined edges. A cloudy interval of 18 minutes preceded No. 802, and no more exposures were possible for over an hour afterwards. I had no opportunity, therefore, to ascertain whether this marking was moving at the same rate as the comet: it is certainly not shown on the earlier plates, and no trace of it can be seen on a direct photograph taken about two minutes earlier.
**The Transit of Halley's Comet.**

By A. B. Chatwood.

Extract from a letter to the Astronomer Royal, dated Secunderabad, Deccan, 1910 May 19:

**Transit of Halley's Comet.**

Very careful visual observation at this time failed to reveal the presence of the comet, and the immersgence and emergence could not be detected. Observations were made with the 8-in Cooke 133-in. focal length triplet and single achromatic eyepiece 1·25-in. focal length and others. I cabled you as follows:

Transit no trace comet seen

Chatwood.

—and trust this negative information will be useful.

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**Halley's Comet: Transit across the Sun, 1910 May 18.**

By W. E. Cooke, M.A.

Two sets of ephemerides were available, one giving 14 h 22 m G.M.T. as the time of first contact, and the other, from *Popular Astronomy*, April 1910, p. 240, giving 15 h 50 m. The weather has been unusually cloudy for some weeks, and the first possible chance of an observation for several days occurred last night, when a hasty setting gave the approximate position of

R.A. 6 h 56 m 10 s and Decl. +15° 28′ on May 21, 22 h 5 m G.M.T.

(A 10°-exposure photograph was also obtained, from which the exact position will be computed.)

This approximate place agrees so closely with the *Popular Astronomy* ephemeris, that we may conclude that the transit across the Sun's disc commenced at 15 h 50 m and finished at 16 h 48 m. This was fortunate, because during the previous two hours, or from 14 h to 16 h, not a glimpse of the Sun was visible. After 16 h, however, several breaks occurred in the clouds, and clear views of the Sun were occasionally obtained. It was viewed by projection on the prepared surface of a Watson "new helioscope projection camera" attached to the 10-inch guiding telescope of the astrograph, and not only the spots but the granules were plainly visible. By giving a slow oscillating movement in R.A. to the telescope the surface markings were rendered still more clear. The results were negative, and not the slightest sign of a shadow or spot was perceptible.

*Perth Observatory:*

1910 May 23.