W. F. Wislicenus, presented by the editor; *Monthly Notices of the Royal Astronomical Society*, vol. 27, presented by W. C. Johnson; Photographs of the great Comet, 1901, presented by Sir David Gill.

The Great Comet of 1901, *as observed at the Royal Observatory, Cape of Good Hope.* By Sir David Gill, K.C.B., F.R.S., His Majesty's Astronomer at the Cape.

On April 24, at 2^h 54^m P.M., a telegram was received as follows:—

From Arthur Hill, Queenstown.

Royal Observatory, Cape Town:

"Saw a Comet this morning at 5 o'clock due East."

The following morning (April 24, astronomical time), the comet was seen by Mr. Innes, Mr. Lunt, and myself. Its position was first observed by Mr. Innes with the 10-inch guiding telescope of the astrographic equatorial, and afterwards by Messrs. Lunt and Innes with the 18-inch refractor of the McClean telescope. The nucleus was visible for some time after sunrise, but could not be followed as far as meridian passage. The observed places on this date depend on readings of the R.A. and Decl. circles, of which the index-errors were found by observations of the planet *Mercury*. The places given are corrected for refraction. On April 25 (astronomical date) there was dense fog on the eastern horizon, and the comet could not be seen. On April 26 similar circle observations to those of April 24 were secured with great difficulty by Messrs. Innes and Lunt on account of the strong light of the background of the sky.

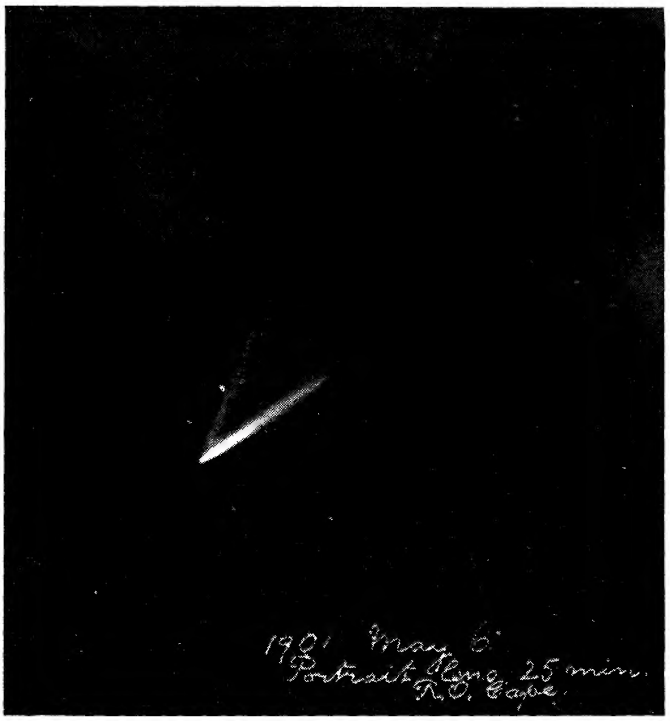
On April 27 Mr. Lunt pointed the 6-inch equatorial to the ridge of the distant Hottentot Hollands Mountains at the expected setting in declination, and so saw the comet enter the field over the mountains, and thus obtained some readings of the circles, but the results are of doubtful value.

Cloudy weather intervened from April 27 till May 3, when the first accurate series of observations was secured by Mr. Innes, and no subsequent opportunity was lost by him. The preliminary results of reduction of all his observations are attached, together with an approximate orbit derived by him from his observations of May 3, 5 and 7.

Mr. Innes's drawing represents the comet as seen with the naked eye on April 24, the formation of the head and of the portions of the tail near the head being drawn with the assistance of the telescope.

1901 May 4
McCLEAN TELESCOPE
Exposure 15 minutes

1901 May 5
13 IN. ASTROGRAPHIC EQUATORIAL



1901 May 6
PORTRAIT LENS
Exposure 25 minutes

1901 May 7
PORTRAIT LENS
Exposure 25 minutes

Mr. Lunt's drawing of the comet on May 12 gives a very exact representation of the naked-eye view of this remarkable object.

It is desirable to defer a more detailed account of the physical appearance of the comet until our photographs, &c., have been properly reproduced and discussed.

Meanwhile the accompanying photographs and the notes of Mr. Lunt and Mr. Innes will be of interest to the Society.

Lantern Slides prepared from Negatives taken with the McClean Telescope.

*1. Taken 1901 May 4. Exposure 15^m.

2. „ „ 6. „ 10^m.

Lantern Slides prepared from Negatives taken with a Portrait Lens.

*3. Taken 1901 May 6. Exposure 25^m.

*4. „ „ 7. „ 25^m.

5. Copy of Mr. Lunt's drawing of comet on May 12.

Contact Prints from Original Negatives taken with the 13-inch Astrographic Equatorial.

No. 6300*a*.	May 4.	Exposure,	10^s	at $9^h\ 14^m$	sid. time.
6300*b*.	„ 4.	„	20^s	$9^h\ 19^m$	„
*6302.	„ 5.	„	$13^m\ 44^s$	$9^h\ 15^m$	„
6305.	„ 6.	„	15^m	$9^h\ 28^m$	„

The spectrum of the comet appears to be continuous; at least, with the means at our disposal, we have been unable to detect any bright lines. It unfortunately happened that, only a few days before the comet appeared, the large McClean spectroscope was sent off to England in order to have a new prism-box fitted.

Circle Readings.†

1901.	G.M.T. h m	R.A. h m s	Dec. ° ′	
April 24	16 37·2	1 29 55	+3 27·8	Innes, 10-inch telescope
	17 5·0	1 29 56·1	3 26 9	Lunt, McClean „
	17 31·4	1 30 14·5	...	„ „ „
	17 34·4	...	3 25·4	„ „ „
26	16 54·0	1 58 8·4	1 17·9	Innes, 10-inch telescope
	17 11·6	1 58 8·6	1 19·0	Lunt, McClean telescope
27	17 10·8	2 14 6·2	+0 24·8	Lunt, 6-inch telescope

* Reproduced, Plates 14 and 15.

† All corrected for refraction.

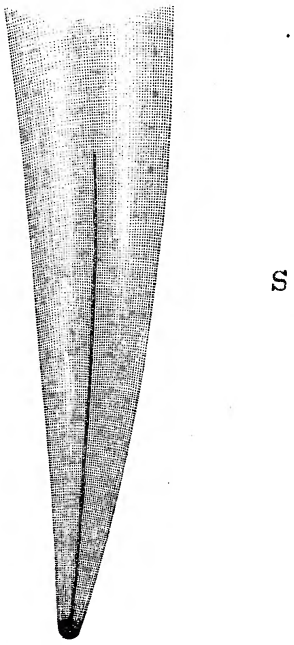
*Equatorial Comparisons.**

1901.		G.M.T. h m s	R.A. h m s	Dec. ° ′ ″			
May	3	5 4 43	3 40 32·39	−0 32 18·6	Innes, McClean telescope		
	4	5 15 0	3 54 29·23	−0 18 27·9	Innes, 7-inch telescope		
	5	4 57 46	4 7 9·97	−0 1 32·4	,,	,,	,,
		5 29 24	4 7 25·23	−0 1 7·7	,,	,,	,,
	6	4 49 45	4 19 7·04	+0 18 23·3	,,	,,	,,
		5 5 48	4 19 14·91	+0 18 34·8	,,	,,	,,
		5 15 18	4 19 19·21	+0 18 37·1	,,	,,	,,
	7	5 1 15	4 30 24·20	+0 40 15·0	,,	,,	,,
	11	4 50 17	5 7 38·74	+2 13 45·1	,,	,,	,,
	12	4 49 56	5 15 22·65	+2 36 50·6	,,	,,	,,
		5 37 58	5 15 38·08	+2 37 39·3	,,	,,	,,
	13	4 59 28	5 22 38·71	+2 59 39·5	,,	,,	,,

Orbit.

T 1901 April 24·244
ω 202° 58′
Ω 110° 10′
ι 130° 44′
q 0·24251

Observations used, May 3–5–7.



Drawing by R. T. A. Innes. 1901 April 24.

* All corrected for refraction.

Observations by Mr. R. T. A. Innes.

1901 April 24. On account of conflicting telegrams, I had kept watch from about 15^h. About 17^h 30^m, when day was breaking, I had begun to despair of seeing any comet, but on giving a final look round in very bright twilight I saw two sheafs of light rising above the mountains in the east. A few minutes later the comet had entirely risen. It was a brilliant object with a bright nucleus and a tail about 10° in length, curved on the southern side. The colour of all was a very deep yellow, but the comet was very near the horizon. Through the 10-inch guiding telescope (now in broad daylight) the yellow tint of the nucleus was very marked. There was no coma visible, the tails (see drawing) springing directly from the nucleus. By comparison with *Mercury*, the nucleus was estimated to be two-thirds of *Mercury's* diameter, which makes it about 4″ ; its brightness was about equal to *Mercury's*.

When next seen with the 10-inch on April 26 the comet was very faint, but the nucleus did not seem smaller. On April 27 I could not find the comet, nor did I see it again until the evening of May 3, when the tail was quite altered. It now consisted of two nearly equal portions streaming from each side of the nucleus, not very unlike De La Rue's drawings of the comet of 1861, but the nucleus was round.

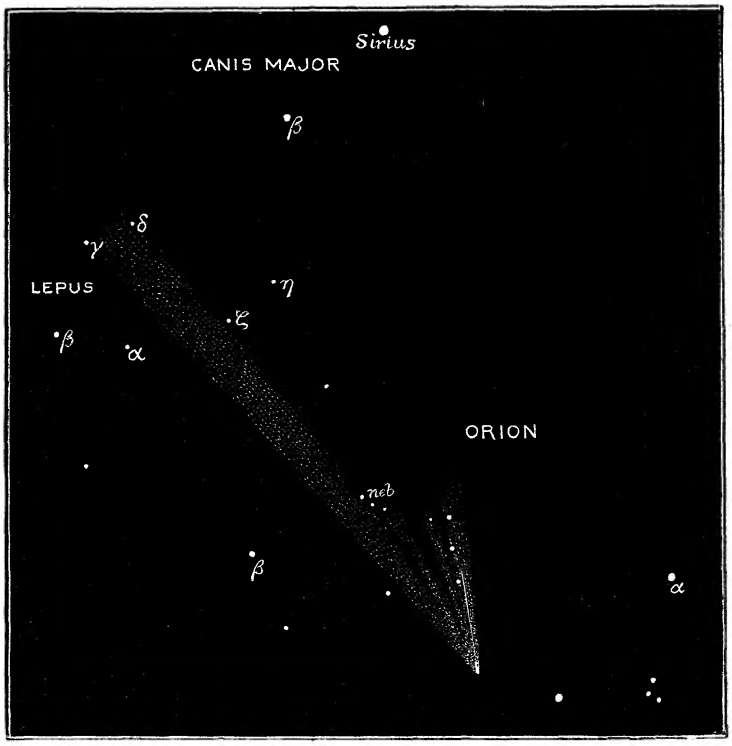
Evening Observations of Comet, 1901 *May* 3-*May* 12. *Mr. Lunt's description.*

The most remarkable feature of the comet, viz. the long faint preceding tail, did not become visible until the comet had emerged from the strong twilight. It was first seen on the evening of Friday, May 3, as a faint ray, scarcely distinguishable, springing from the head at an angle of about 40° to the main tail. This faint tail appeared on two photographs taken with a portrait lens the same evening. On the two following nights, however, as the comet receded further from the Sun and became visible against a darker sky, it was a most conspicuous feature. On the evening of Monday, May 6, the faint tail was seen to be quite four times as long as the main tail and fully 30° in length, but fading away so gradually that it was difficult to place any exact limit to it. At this time the comet attained its maximum splendour as a naked-eye object. With an exposure of 25 minutes a portrait lens showed not only the main faint tail, but two still fainter rays between it and the bright tail, clearly discernible in the lantern slide sent herewith.

The space on each side of the faint rays was filled with faint light, and the darker space between them showed clearly by contrast, although the two faint rays themselves were not so well marked to the eye as they appear in the photograph.

In the accompanying drawing I have endeavoured to represent the dimensions and most striking features of the comet as revealed both by eye observations and photographs. The position is that of the evening of Sunday, May 12, by which time the comet had become intrinsically much fainter, although as seen in a still darker sky it was yet a magnificent object.

The preceding side of the main tail was not then so markedly stronger than the following side as previously, but the tail still streamed off from each side of the nucleus in rays brighter than the space between them, which was filled with fainter light. The faint preceding tail was still fully 25° long, and reached, as shown in the drawing, as far as δ *Leporis*. The bright tail was about 7° long, and could be traced beyond ζ *Orionis* ; its fading beyond this point was much sharper than in the case of the faint tail.



Drawing by J. Lunt. 1901 May 12, 7.15 P.M. Cape Time.

The drawing shows the two short faint rays between the two main tails as they were photographed on May 6, but for clearness somewhat exaggerated in intensity.

The Oxford Photographic Determinations of Stellar Parallax. Reply to Professor Turner. By Sir David Gill, K.C.B., F.R.S., His Majesty's Astronomer at the Cape of Good Hope.

Professor Turner, in meeting my criticisms of the Oxford parallax observations, unfortunately does not touch the principal grounds for doubting the reliability of the Oxford results.

First of all Professor Turner does not refer to Pritchard's fundamentally unsound assumption that, by the methods which Pritchard employed, it is admissible to give independent results for the parallax of the principal star relative to each of two opposite comparison stars. It is obvious that as the scale-value is derived from the distance between the comparison stars a and b, it must be assumed either that their distance $a\,b$ is constant, or that it varies proportionally to the time. But, if the parallaxes of the comparison stars are not identical, the distance between the stars will vary with the season of the year, and consequently the correction for scale-value (*i.e.* the corrected observed distances) will vary proportionally to this change. In other words, if the comparison stars are situated systematically with respect to the principal star, we should, by Pritchard's methods, obtain the parallax of the principal star relative to the mean of the parallaxes of the two comparison stars, but we have no means of distinguishing, as Pritchard attempted to do, between the parallax of the principal star as derived by measures from star a and those from star b.

The obvious answer to such criticism is—then, why not take the means of Pritchard's parallaxes from the stars a and b, and accept the result as the true parallax of the principal star relative to the mean parallaxes of the stars a and b?

The answer to this question is given in a part of my criticism which Professor Turner omits to quote, and it runs as follows :—

"Although Pritchard frequently vaunts the novelty of his method, he takes no precaution to test its systematic accuracy. By simply taking photographs in the same season of the year at widely different hour-angles he might readily have ascertained whether the *apparent* parallaxes which he derived from observations six months apart, were really, in whole or in part, a function of the hour-angle at which the observations were made. It is obvious, for example, that any displacement of the apparent centre of the star's disc by chromatic dispersion of the atmosphere will, especially in the case of a bright star, be recorded on the photographic plate, and will not be eliminated, as in the heliometer observations, by the observer's superposing the