No.	t	ϱ
H II 83	1783.15	4".6
84	.16	3.9
85	.17	3.7
86	.18	6.8
87	.18	4.2
88	.18	6.2
89	.23	10.4
90	.24	6.3
91	.26	5.3
»	.26	8.4
92	.33	5.7
H II 93	1783.40	4".5
94	.63	5.0
95	.70	5.5
96	.70	3.7
97	.71	4.5
98	.71	4.0
99	.71	4.4
100	.73	4.4
101	.74	4.1
102	.74	4.3
H III 13	1779.77	6.4
H III 18	1781.39	4".4
	1803	4.4
22	1780.60	6.5
37	1781.73	11.5
38	.73	13.7
55	1782.45	7.4
H N 21	1809.04	5.0
24	.04	5.9
38	1786.24	5.1
92	1792.80	1.9
	1801.94	1.5
H N 98	1793.36	6".2
99	1793.36	5.0
114	1796.26	2.1
	1807.53	1.6
115	1796.60	5.0
117	1797.82	1.2
118	1797.94	4.1
133	1801.71	2.0
143	1802.08	1.5

Sutton, Surrey, 4th January 1909. *W. Doberck.*

Micrometer observations of the Tempel$_3$-Swift periodic comet, with observations of three new double stars and four new nebulae. And on the crimson star BD +43°53.

By *E. E. Barnard.*

1908	Centr. St. T.	$\Delta\alpha \cos\delta$ measured	$\Delta\alpha$	$\Delta\delta$	Cp.	α app.	δ app.	Red. ad l. app.	*
Dec. 1	$14^h 41^m 58^s$	—	—	−0' 19".0	3	—	+17° 24' 19".4	$+2^s.31$ −11".9	1
	14 50 39	+123".0	$+0^m 8^s.58$	—	4	$9^h 31^m 58^s.73$	—	— —	1
	14 58 20	—	—	−0 24.2	3	—	+17 24 14.2	— —	1
20	14 24 57	—	—	−0 12.3	5	—	+14 50 38.3	+2.77 −14.0	2
	14 35 27	− 87.1	−0 6.01	—	5	9 31 55.81	—	— —	2
	14 43 34	—	—	−0 20.5	4	—	+14 50 30.1	— —	2
	15 21 44	−110.4	−0 7.61	—	2	9 31 54.21	—	— —	2
24	14 13 43	—	—	−0 21.0	5	—	+14 31 32.3	+3.04 −14.4	3
	14 24 27	+114.3	+0 7.87	—	5	9 29 12.41	—	— —	3
	14 34 31	—	—	−0 27.3	3	—	+14 31 26.0	— —	3
29	15 13 41	+ 82.1	+0 5.65	—	5	9 24 36.85	—	+3.20 −14.7	4
	15 26 7	—	—	−3 30.5	6	—	+14 13 23.5	— —	4
	15 36 30	+ 69.7	+0 4.80	—	3	9 24 36.00	—	— —	4

Mean places of comparison stars.

*	α 1908.0	δ 1908.0	Authority
1	$9^h 31^m 47^s.84$	+17° 24' 50".3	Compared with BD +17°2107 (Compt. Rend. 112.606)
2	9 31 59.05	+14 51 4.6	» » AG Berl A 3863
3	9 29 1.50	+14 32 7.7	» » AG Lpz I 3801
4	9 24 28.00	+14 17 8.7	» » » 3784

Observations of comparison stars.

*	Mag.	$\Delta\alpha$	Comps. (tr.)	$\Delta\delta$	Cp.
1	$12\frac{1}{2}$	$+1^m 0^s.83$	14	−1' 26".4	5
2	13.8	+1 7.63	10	+3 37.9	4
3	9.2	−1 27.29	12	−0 40.2	3
4	$9\frac{1}{2}$	−2 59.39	8	+1 58.0	2

Star no. 4 is BD +14°2099,

1855.0 $9^m.5$ $9^h 21^m 28^s.2$ +14° 30'.1.

The observations show that this place is in error. They give for its position:

1855.0 $9^h 21^m 33^s.6$ +14° 31'.0.

Notes on the comet.

Dec. 1. Very faint. 16 mag. Round and diffused, $\frac{1}{2}$' in diameter. Dreyer NGC 2928 was near, south following. The comet was very much fainter than the nebula, which was estimated to be $14\frac{1}{2}$ mag. This nebula was compared with the comparison star used with the comet

$$\Delta\alpha \cos\delta = +239".8 \ (3) \quad \Delta\delta = -79".1 \ (5).$$

At this time the nebulae NGC 2933, 2934, 2941 and 2943 were also seen.

Dec. 20. Very faint. 16 or $16\frac{1}{2}$ mag. 15" diameter.

Dec. 24. Comet excessively faint, $16\frac{1}{2}$ mag. 10"± diameter, *v g b M.*

Dec. 29. The comet was at the limit of vision. Diffused, 10″ or 15″ diameter. The sky was not very transparent, however.

The measures were all made with the 40-inch telescope. In each case I assured myself that it was the comet that was observed — either at the time of observation or by returning to the place at another date.

This comet was rediscovered by the writer with the 12-inch telescope of the Lick Observatory on Sept. 27, 1891, at its first predicted return (A. N. 3061, Bd. 128, p. 237). Though it was then faint and diffused, it was some five times brighter theoretically, than at the last observation with the 40 inch telescope on 1908 Dec. 29. At its return (unpredicted) in 1880 this comet was discovered by Lewis Swift at Rochester, New York, on Oct. 10. No observations were obtained of it after this (with the exception of one on Oct. 11 by Boss) until I observed it on Oct. 21 at Nashville, Tenn., with a ring micrometer on a 5-inch telescope. This position enabled astronomers in this country to locate the comet, and was used by Chandler as the first position in the determination of the comet's orbit, which enabled him to recognize in it a return of Tempel's comet (1869 III). It was not observed in Europe until Nov. 7 when it was found by Lohse, at Dunecht, who supposed it was new. In looking up the matter in A. N. 2348, Bd. 98, p. 319 I find that I was erroneously located at Jersey City! This should be corrected to read Nashville, Tenn., as it badly affects the time. My position on 1880 Oct. 21 cannot be very exact because of the large and diffused nature of the comet. The comparison star on that date was the celebrated $\varkappa$ Pegasi (β 989) which had only been discovered to be double by Burnham on August 12 of the same year. The comet was then very large and very diffused. It was relatively near the earth at that time, which would account for both these facts.

New double star and two new nebulae.

On December 27 two nebulae were observed near the place of the comet, one of which was mistaken for the comet. The first was compared with the star BD +14°2107:

$$\Delta\alpha \cos\delta = -135''.7 \quad (4)$$
$$\Delta\alpha = -0^m 9^s.33 \quad \Delta\delta = -3'\,39''.7 \quad (6).$$

This gives the position of the nebula

$$1860.0 \quad \alpha = 9^h 24^m 41^s.0 \quad \delta = +14°\,17'.8.$$

It is 15th magnitude and 15″ diameter.

BD +14°2107 itself is double. Its place is according to Bo VI:

$$1855.0 \quad \alpha = 9^h 24^m 33^s.89 \quad \delta = +14°\,22'\,53''.1.$$

The measures are:

1908.990	Dec. 27	194°.0	1″.94	9ᵐ.2	11ᵐ.1
.995	29	192.5	1.47	9.5	11
1908.992		193.2	1.70	9.3	11.0

Poor seeing on both dates made the observations difficult.

The nebula and the double star seem to be new. The other nebula was compared with BD +14°2105

$$1855.0 \; 9^m.3 \quad \alpha = 9^h 24^m 27^s.4 \quad \delta = +14°\,33'.4$$
$$\Delta\alpha \cos\delta = -230''.2 \quad (5)$$
$$\Delta\alpha = -0^m 15^s.83 \quad \Delta\delta = +0'\,13''.5 \quad (6).$$

This gives the position of the nebula

$$1860.0 \quad \alpha = 9^h 24^m 28^s.1 \quad \delta = +14°\,32'.3.$$

This also seems to be new.

There seems to be some discordance in the places of one or more of the three BD stars near this point.

In this connection it may not be out of place to record two other new double stars and two new nebulae which were found in searching for comet 1907 I.

BD +43°31 (1855.0 $0^h 6^m 50^s.6$ +43° 2′.4).

1908.981	Dec. 24	348°.9	4″.17	8ᵐ.2	10ᵐ.5
.990	27	347.7	3.90	8.4	10.5
1908.985		348.3	4.03	8.3	10.5

BD +43°24 (1855.0 $0^h 6^m 3^s.2$ +43° 23′.2).

1908.981	Dec. 24	274°.2	1″.57	9ᵐ.2	10ᵐ.0
.990	27	275.5	1.56	9.2	9.8
1908.985		274.8	1.56	9.2	9.9

A careful search was made for the **comet 1907 I** close to the ephemeris place on several dates in December 1908 under fair conditions, but it was not found. Time would not permit any extended search far from the assigned position.

Two faint uncatalogued nebulae were found in the search (and were seen subsequently). The first nebula was referred to the star BD +42°28. Position angle of the nebula 84°.33 (2) Distance 182″.9 (2), $\Delta\alpha = +0^m 16^s.59$ $\Delta\delta = +0'\,18''.2$. These give the position of the nebula:

$$1860.0 \quad \alpha = 0^h 6^m 14^s.4 \quad \delta = +42°\,56'.3.$$

It is 15.5 or 16 magnitude, and about 5″–6″ diameter, and difficult. There is a $14^m.8$ star in the position (with reference to the nebula)

P. A. 155°.2 (2) Dist. 11″.2 (2).

The second nebula was referred to BD +43°43

$$\Delta\alpha = -1^m 10^s.50 \text{ (10 tr.)} \quad \Delta\delta = +1'\,58''.7 \quad (3).$$

This gives the position

$$1860.0 \quad \alpha = 0^h 9^m 7^s.1 \quad \delta = +43°\,59'.6.$$

This nebula is 15 or $15\frac{1}{2}$ magnitude. It is $\frac{1}{4}'$ diameter and lies between two $12^m.6$ stars, amidst a field of small bright stars.

In the search the star **BD +43°53** was observed. It is one of the finest crimson stars in the sky. On Dec. 20, 1908, it was an exquisite object with the great telescope.

Yerkes Observatory, Williams Bay, Wisc., 1909 January 8. *E. E. Barnard.*