*Nova Geminorum* 2 (*Enebo*); *its Position for* 1900·0, *together with those for* 102 *Stars surrounding the Nova, as deduced from Measures on a Photograph taken at the University Observatory, Oxford.* By F. A. Bellamy, M.A.

This star was discovered without a telescope by M. Sigurd Enebo, of Dombaas, on March 12, at $8^h\ 32^m$ mean mid-Europe time. Owing to moonlight and cloudy weather no photograph was obtained at this Observatory (with the astrographic telescope of 13 inches aperture) until March 25, when two exposures of $6\frac{1}{2}$ and $6\frac{1}{4}$ minutes were given at $1^h\ 28^m$ west hour-angle; the night was fairly good for photographic work, and a satisfactory plate was obtained.

The plate shows stars to the twelfth magnitude; the images of the *Nova* are very large, being exposed about the period of its second increase in brightness. The object of this note is to record its position, also those of a number of faint stars near the *Nova*, for future use. The area in which all the stars visible on the plate have been measured is situated within about ten minutes of arc radius from the *Nova*; these are mostly stars of the tenth to the twelfth magnitudes. The bright stars on the plate were observed at Leiden; these have been measured and form the basis of the plate-constants: other stars from the eighth to the tenth magnitudes have been measured so as to obtain positions of sufficient stars to afford a good sequence of magnitudes from the seventh to the twelfth, when the *Nova* fades between those limits.

The adopted plate centre is $+32°\ 0'$ and $6^h\ 49^m$ for 1900·0. The rectangular co-ordinates $\xi$ and $\eta$ have been computed with this centre and referred to the corner of the plate by the addition of 11·0000 *réseau* intervals to the calculated $\xi$'s and $\eta$'s in order to get $\xi'$ and $\eta'$. These standard co-ordinates are given in Table IV., the sixth and seventh columns.

The plate-constants have been determined from 21 stars in the Leiden A.G. Catalogue, reduced to epoch 1900·0, well scattered over the plate. The standard co-ordinates $\xi'$ and $\eta'$ were calculated by the usual formula by means of MS. tables for $0°$ to $+64°$ existing at this Observatory, and of similar construction to those already printed in the Astrographic Catalogues (Oxford) for $+25°$ to $+31°$, to which reference may be made for the formulæ used. The residuals for these 21 stars, as well as twelve other Leiden stars not included in the equations from which the plate-constants were determined, are shown in Table I. Notes relating to seven of these stars follow at the end of the Table.

The region under consideration falls on the edges of two plates, Nos. 46 and 47, printed in the *Potsdam Astrographic Catalogue*, vol. iv. The position of the *Nova* would be $+8·5$ intervals in $x$ from the centre of plate 46; it is outside plate 47.

There are 56 stars, of the 102 mentioned in this paper, that are common to Oxford and Potsdam plates; most of these are the bright stars (Leiden Catalogue) upon which the constants for the plates are based. In the restricted area around the *Nova* I give 45 stars to the twelfth magnitude; 9 of these are on the Potsdam plates. A number of the stars south of $+32° 0'$ are also in the *Oxford Astrographic Catalogue*, vol. i., plate 2121.

In Table I. the Potsdam plate and number and B.D. numbers are added for convenience of easy reference.

TABLE I.

| Oxford No. | Leiden A.G. Cat. | Potsdam IV. | B.D. | Oxford—Leiden. | |
|---|---|---|---|---|---|
| | | | ° | s | ″ |
| 1 | 2841 | 46, 101 | 32, 1418 | −·09 | −0·3 |
| 2 | 2843 | 46, 107 | 32, 1419 | −·03 | −1·6 |
| 3 | 2844 | 46, 120 | 32, 1420 | −·08 | − ·6 |
| 4 | 2845 | 46, 123 | 32, 1421 | ·00 | + ·1 |
| 5 | 2850 | ... | 33, 1421 | −·05 | − ·7 |
| 6 | 2852 | 46, 157 | 32, 1424 | −·03 | − ·8 |
| 8 | 2857 | 46, 185 | 31, 1428 | −·10 | − ·4 |
| 14 | 2861 | 46, 215 | 31, 1433 | +·03 | − ·2 |
| 19 | 2862 | 46, 221 | 32, 1433 | +·03 | + ·1 |
| 20 | 2863 | ... | 33, 1428 | +·04 | + ·1 |
| 21 | 2864 | 46, 223 | 32, 1434 | +·02 | + ·7 |
| 25 | 2865 | 46, 227 | 31, 1434 | +·04 | − ·7 |
| 28 | 2866 | 46, 229 | 32, 1436 | +·04 | + ·9 |
| 42 | 2867 | 46, 243 | 33, 1429 | −·03 | + ·3 |
| 49 | 2868 | 46, 245 | 32, 1437 | +·08 | +1·0 |
| 50 | 2870 | 46, 246 | 31, 1438 | −·01 | + ·1 |
| 59 | 2872 | 46, 262 | 31, 1442 | +·10 | +1·9 |
| 61 | 2873 | 46, 265 | 31, 1443 | −·08 | −0·1 |
| 72 | 2876 | 46, 268<br>47, 3 | 31, 1446 | +·12 | +0·4 |
| 81 | 2880 | 46, 275<br>47, 11 | 32, 1441 | +·04 | 0·0 |
| 82 | 2883 | 46, 276<br>47, 14 | 32, 1442 | −·42 | −3·4 |
| 83 | ... | ... | 32, 1442 | −·34 | −7·3 |
| 87 | 2887 | 47, 30 | 31, 1449 | −·08 | + ·8 |
| 89 | 2889 | 47, 39 | 32, 1447 | −·05 | +2·0 |
| 90 | 2895 | 47, 54 | 31, 1453 | +·05 | + ·1 |
| 91 | 2896 | 47, 55 | 32, 1448 | +·02 | +2·1 |
| 92 | 2899 | 47, 69 | 33, 1438 | +·08 | −1·6 |
| 93 | 2901 | 47, 73 | 31, 1457 | −·27 | +1·1 |

TABLE I.—*continued.*

| Oxford No. | Leiden. A.G. Cat. | Potsdam IV. | B.D. | Oxford—Leiden. | |
|---|---|---|---|---|---|
| | | | ° | s | ″ |
| 94 | 2902 | 47, 79 | 32, 1449 | − ·02 | +1·0 |
| 95 | 2903 | 47, 80 | 32, 1450 | + ·10 | − ·3 |
| 98 | 2906 | 47, 107 | 31, 1460 | + ·08 | − ·7 |
| 99 | 2909 | ... | 33, 1446 | − ·03 | + ·7 |
| 101 | 2911 | 47, 128 | 31, 1463 | + ·15 | +1·1 |
| 102 | 2916 | 47, 154 | 31, 1466 | + ·07 | +2·7 |

*Notes.*—Nos. 5, 20, and 99 are outside the regions printed in Potsdam astrographic zones in vol. iv.

No. 8. There are three stars within $2^s$ and 50″; in the Potsdam plate 46 they are given as 185 (8·8 mag.), 186 (9·2), and 187 (10·5); only the brightest of the three has been measured at Oxford for this paper.

Nos. 82, 83. These form the double-star Σ 984. Apparently the star was observed as one mass for the Leiden A.G. Catalogue; as there is a footnote, "Keine Bemerkung über Duplicität." Only one other star has been measured at Potsdam on plates 46 and 47, and no note as to duplicity is given. On the Oxford plate 2891 the image of the fainter star coalesces with the brighter image, but it is quite easy to measure; the difference in R.A. is $0^s{\cdot}12$ and in Dec. 3″·9, and the photographic magnitudes are 8·5 and 9·9; the companion is *s.f.* It would have been better had this star, Leiden 2883, been omitted from the equations upon which the plate-constants are based; but the whole of the calculations were completed before the magnitude of the residuals was noticed; only the brighter star measured on the Oxford plate has been used in the equations.

No. 93. There is a fainter companion to this star; it is *s.f.*, about 9″ and 11·7 mag.

Only the first exposure was measured. Each star was measured in the direct and reversed position of the plate, and the mean of the measures was taken; these measures were corrected for the plate-constants, and, from these corrected measures ($\xi'$ and $\eta'$), the R.A.$^s$ and Dec.$^s$ for 1900·0 were deduced for the convenience of those who still prefer the results in these co-ordinates. Both sets of results, together with the magnitudes and B.D. number, are given in Table IV.

The formula used for obtaining the magnitudes from the measured diameter ($d$) in units of ·001 (0″·3) of the *réseau* is $m = a - b\sqrt{d}$; $a$ and $b$ are constants for this plate, and the photographic magnitude scale adopted is

$$\text{photo-mag.} = 13{\cdot}9 - 1{\cdot}02\sqrt{d}.$$

This gives a very fair agreement with Argelander's magnitudes when we assume that his 8·5 = 8·6 and 9·5 = 9·9 as indicated by Professor Pickering in his photometric work. I have only found one star, No. 19 or B.D. + 32° 1433, in the Harvard photometric results that is among the 102 stars used in this paper: that is given as 6·89 mag. It is also the only star given by Müller and Kempf in the Potsdam Observatory's photometric review of B.D. stars; the number is 4243 in vol. xvii., and the star is noted as 7·22 mag. At least two measures of the diameter of each star have been made, and the mean taken to the nearest half unit; these are given in Table IV., second column, and the deduced magnitudes are in the third column.

In addition to the B.D. stars, whose magnitudes and positions are given in Table IV., I have measured the diameters of all the other B.D. stars on the plate, and obtained their magnitudes by the same formula. Collecting those stars corresponding to the 9·5 mag. B.D. stars, the following results are obtained:—

| | | | | |
|---|---|---|---|---|
| 10·4 | 10·4 | 9·9 | 9·6 | 10·3 |
| 10·2 | 10·4 | 10·3 | 10·3 | 10·5 |
| 10·4 | 9·9 | 10·2 | 9·2 | 9·6 |
| 10·1 | 9·7 | 10·4 | 9·5 | 9·6 |
| 9·5 | 9·6 | 9·4 | 9·7 | |

The mean mag. is 10·0; the groups collected under other magnitudes have insufficient stars. There are only three B.D. stars on the plate with magnitudes brighter than 8·0: they are 7·8 (B.D. 7·8), 7·3 (B.D. 7·8), and 6·9 (B.D. 7·0).

The mean diameter of the *Nova* from ten measures of the first exposure is 80; this, by the same formula, is equal to magnitude 4·8. The semi-diameter, besides the diffusion from the photographic spreading of the image, is 12″; thus all stars within a radius of quite 15″ are lost in the image of the *Nova*.

The following notes upon some of the Argelander stars may be of use:—B.D. + 31° 1425 is given as 9·2 mag.; it is photographically much brighter and, by the size and intensity of the image, is brighter than B.D. + 31° 1433 (7·8 mag.). B.D. + 3°3 1419, given as 9·4 mag., consists of two stars; one is 10·2 and the other *n.f.* ∗ is 10·8. B.D. 31° 1440 is given as 9·2; there are two stars, 9·4 and 10·3 *n.p.* about 33″. B.D. 31° 1445, mag. 9·5, consists of two faint stars, 10·9 and the other 11·0 *n.f.* B.D. 31° 1454, mag. 9·4; there are two stars, mags. 9·5 and 11·6 *n.p.* about 5″. Other notes are appended to Tables I. and III.

For convenience in comparing positions from photographs or from other instruments, the precessions and secular variations for 1900·0 have been computed from Dr. Downing's Tables. Table II. contains this information for a number of points, so that precessions for intermediate positions can be readily interpolated.

TABLE II.

*Precessions and Secular Variations for* 1900·0.

In Right Ascension.

| | Precession. | | | | | | Sec. Var. (100 years). | |
|---|---|---|---|---|---|---|---|---|
| | +31° 0′ | +31° 30′ | +32° 0′ | +32° 30′ | +33° 0′ | +33° 30′ | +31° 0′ | +33° 0′ |
| h m | s | s | s | s | s | s | s | s |
| 6 44 | +3·8605 | +3·8762 | +3·8920 | +3·9080 | +3·9242 | +3·9406 | −·0061 | −·0068 |
| 6 46 | ·8592 | ·8748 | ·8906 | ·9066 | ·9227 | ·9391 | 64 | 71 |
| 6 48 | ·8578 | ·8734 | ·8891 | ·9051 | ·9212 | ·9375 | 67 | 75 |
| 6 50 | ·8563 | ·8719 | ·8876 | ·9035 | ·9196 | ·9359 | 70 | 78 |
| 6 52 | ·8547 | ·8703 | ·8860 | ·9019 | ·9179 | ·9342 | 73 | 81 |
| 6 54 | +3·8531 | +3·8686 | +3·8843 | +3·9002 | +3·9162 | +3·9324 | −·0077 | −·0085 |

In Declination.

| | Precession. | Sec. Var. (100 years). | | |
|---|---|---|---|---|
| | | +31° 0 | +32° 0′ | +33° 0′ |
| h m | ″ | ″ | ″ | ″ |
| 6 44 | −3·825 | −0·551 | −0·555 | −0·560 |
| 6 46 | 3·997 | ·550 | ·554 | ·559 |
| 6 48 | 4·168 | ·548 | ·553 | ·557 |
| 6 50 | 4·339 | ·547 | ·551 | ·556 |
| 6 52 | 4·509 | ·546 | ·550 | ·555 |
| 6 54 | −4·680 | −0·544 | −0·549 | 0·553 |

The position of the *Nova* deduced from the ten bisections of image, is for

| | R.A. | $\xi'$. | Dec. | $\eta$ |
|---|---|---|---|---|
| | h m s | R.I. | ° ′ ″ | R.I. |
| 1900·0 | 6 48 25·073 | 9·5230 | +32 15 57·54 | 14·1928 |
| 1912·0 | 6 49 11·834 | | +32 15 6·70 | |

The size of the image, approximately 30″ in diameter, renders the bisections difficult.

In the last two numbers of the *Astronomische Nachrichten*, Nos. 4563 and 4564, some positions of the *Nova* have been published.

It may be of interest to collect these, as some are obtained by means of the meridian instrument, some by micrometer comparisons from one or two bright stars, and from photographs.

| | 1912·0. | 1912·0. | |
|---|---|---|---|
| | h m s | ° ′ ″ | |
| Heidelberg | 6 49 11·70 | +32 15 5·5 | Photograph. Measured by F. Kaiser from 2 Leiden stars, 2864 and 2886. |
| Oxford | 6 49 11·83 | 32 15 6·7 | Photograph. Referred to 21 Leiden stars. |
| Leiden | 6 49 11·66 | 32 15 5·8 | Meridian. J. Voûte. Berl. Jahr. and Leiden 2845 used. |
| Copenhagen | 6 49 11·82 | 32 15 5·5 | Meridian. J. Braae. |
| Rome | 6 49 11·82 | 32 15 6·2 | Micrometer. E. Millosevich, from Leiden 2845. |
| Bamberg | 6 49 11·84 | 32 15 6·0 | Micrometer. E. Hartwig, from Leiden 2862. |
| Hamburg | 6 49 11·79 | 32 15 5·7 | Micrometer. K. Graff, from Leiden 2845. |
| Leiden | 6 49 11·70 | +32 15 5·1 | Micrometer. J. Voûte, from Leiden 2845. |

In Table I. I give the corrections to each Leiden star (or the residuals O–L) obtained from this plate. Leiden 2845 (Oxford No. 4) has $^{s}{\cdot}00$ and $+''{\cdot}1$; Leiden 2862 (Oxford No. 19) has $+^{s}{\cdot}03$ and $+''{\cdot}1$; and Leiden 2864 (Oxford No. 21) has $+^{s}{\cdot}02$ and $+''{\cdot}7$; Leiden 2886 is outside plate 2891.

The two faint stars, 13 and 15 mags., close to the *Nova*, indicated by Dr. Max Wolf as having been measured on one of Dr. Kopff's plates taken in 1909, are lost in the large image of the *Nova* on the Oxford plate.

The magnitude and colour were noted by F. F. Petersen, of Copenhagen, as 5·4 reddish on March 20, 4·7 bluish on March 25, 4·9 on March 26, and 5·8 reddish on March 26. I took plate 2891 on March 25, may this colour effect account for the large image?

Dr. Max Wolf in the *Astronomische Nachrichten*, No. 4562, gives a chart of the region and specially indicates 12 stars; these stars are included in the 102 stars in Table IV., and the following Table III. contains the Oxford number and magnitudes corresponding to the 12 stars in his list, together with the B.D. number and magnitude.

TABLE III.

| Oxford. | | Max Wolf. | B.D. | |
|---|---|---|---|---|
| No. | Photo. Mag. | No. | No. | Mag. |
| 10 | 9·8 | 1 | +32°1431 | 9·1 |
| 11 | 9·3 | 2 | 1432 | 9·2 |
| 19 | 6·9 | 3 | 1433 | 7·0 |
| 21 | 8·4 | 4 | 1434 | 8·6 |
| 23 | 10·4 | 5 | 1435 | 9·3 |
| 28 | 9·4 | 6 | 1436 | 8·9 |
| 49 | 8·5 | 7 | 1437 | 8·0 |
| 73 | 9·4 | 8 | 1439 | 9·5 |
| 80 | 9·7 | 9 | 1440 | 9·2 |
| 81 | 8·8 | 10 | 1441 | 8·7 |
| 82 | 8·4 | 11 | 1442 | 8·6 |
| 85 | 9·2 | 12 | 1443 | 9·2 |

Oxford No. 23 is photographically faint, at least it is so on plate 2891.

Table IV. has been explained in the preceding remarks. It contains the results of the measures of 102 stars, besides the *Nova*, tabulated in a convenient form for reference.

TABLE IV.

| Oxford. No. | Oxford. Diam. | Oxford. Mag. | B.D. No. | B.D. Mag. | Standard Co-ordinates. 1900·0. $\xi'$. | Standard Co-ordinates. 1900·0. $\eta'$. | R.A. 1900·0. h | m | s | Dec. 1900·0. ° | ′ | ″ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° | | R.I. | R.I. | h | m | s | ° | ′ | ″ |
| 1 | 40 | 7·4 | 32, 1418 | 8·3 | −0·908 | 21·480 | 6 | 44 | 16·47 | +32 | 52 | 3·8 |
| 2 | 22·5 | 9·1 | 32, 1419 | 9·1 | −0·651 | 11·486 | 6 | 44 | 25·11 | 32 | 2 | 7·3 |
| 3 | 24 | 8·9 | 32, 1420 | 9·1 | +0·314 | 11·636 | 6 | 44 | 47·85 | 32 | 2 | 55·2 |
| 4 | 42·5 | 7·3 | 32, 1421 | 7·8 | 0·493 | 14·357 | 6 | 44 | 51·47 | 32 | 16 | 31·9 |
| 5 | 34 | 7·9 | 33, 1421 | 9·0 | 2·543 | 25·948 | 6 | 45 | 37·83 | 33 | 14 | 33·4 |
| 6 | 30 | 8·3 | 32, 1424 | 8·8 | 3·336 | 22·015 | 6 | 45 | 57·45 | 32 | 54 | 55·9 |
| 7 | 25 | 8·8 | 31, 1427 | 9·2 | 3·745 | 4·824 | 6 | 46 | 9·88 | 31 | 29 | 0·2 |
| 8 | 27·5 | 8·6 | 31, 1428 | 8·8 | 4·928 | 6·007 | 6 | 46 | 37·47 | 31 | 34 | 57·1 |
| 9 | 30 | 8·3 | 31, 1432 | 9·2 | 6·747 | 0·256 | 6 | 47 | 20·68 | 31 | 6 | 14·7 |
| 10 | 16·5 | 9·8 | 32, 1431 | 9·1 | 6·862 | 15·125 | 6 | 47 | 22·06 | 32 | 20 | 35·1 |
| 11 | 20 | 9·3 | 32, 1432 | 9·2 | 6·894 | 13·983 | 6 | 47 | 22·92 | 32 | 14 | 52·6 |
| 12 | 5·5 | 11·5 | ... | ... | 7·082 | 15·897 | 6 | 47 | 27·20 | 32 | 24 | 27·0 |
| 13 | 4 | 11·9 | .. | ... | 7·134 | 13·424 | 6 | 47 | 28·64 | 32 | 12 | 5·2 |
| 14 | 36 | 7·8 | 31, 1433 | 7·8 | 7·189 | 1·941 | 6 | 47 | 30·87 | 31 | 14 | 40·5 |
| 15 | 9 | 10·8 | ... | ... | 7·285 | 14·905 | 6 | 47 | 32·09 | 32 | 19 | 29·6 |
| 16 | 3 | 12·2 | ... | ... | 7·347 | 14·857 | 6 | 47 | 33·56 | 32 | 19 | 15·2 |
| 17 | 4 | 11·9 | ... | ... | 7·414 | 14·588 | 6 | 47 | 35·17 | 32 | 17 | 54·6 |
| 18 | 19·5 | 9·4 | ... | ... | 7·424 | 13·044 | 6 | 47 | 35·52 | 32 | 10 | 11·4 |
| 19 | 47·5 | 6·9 | 32, 1433 | 7·0 | 7·508 | 18·617 | 6 | 47 | 37·08 | 32 | 38 | 3·3 |
| 20 | 42·5 | 7·3 | 33, 1428 | 8·3 | 7·715 | 24·514 | 6 | 47 | 41·58 | 33 | 7 | 32·2 |
| 21 | 29·5 | 8·4 | 32, 1434 | 8·6 | 7·721 | 16·353 | 6 | 47 | 42·30 | 32 | 26 | 44·4 |
| 22 | 13 | 10·2 | ... | ... | 7·892 | 15·326 | 6 | 47 | 46·42 | 32 | 21 | 36·5 |
| 23 | 12 | 10·4 | 32, 1435 | 9·3 | 7·919 | 18·738 | 6 | 47 | 46·84 | 32 | 38 | 40·0 |
| 24 | 7 | 11·2 | ... | ... | 7·932 | 15·860 | 6 | 47 | 47·34 | 32 | 24 | 16·7 |
| 25 | 23·5 | 9·0 | 31, 1434 | 8·5 | 7·911 | 6·531 | 6 | 47 | 47·46 | 31 | 37 | 38·0 |
| 26 | 10 | 10·7 | ... | ... | 8·013 | 14·843 | 6 | 47 | 49·32 | 32 | 19 | 11·7 |
| 27 | 6 | 11·4 | ... | ... | 8·083 | 15·713 | 6 | 47 | 50·92 | 32 | 23 | 32·7 |
| 28 | 19·5 | 9·4 | 32, 1436 | 8·9 | 8·094 | 17·793 | 6 | 47 | 51·05 | 32 | 33 | 56·7 |
| 29 | 8 | 11·0 | ... | ... | 8·091 | 14·571 | 6 | 47 | 51·18 | 32 | 17 | 50·1 |
| 30 | 3 | 12·2 | ... | ... | 8·135 | 12·596 | 6 | 47 | 52·35 | 32 | 7 | 57·7 |
| 31 | 18 | 9·6 | ... | ... | 8·266 | 15·141 | 6 | 47 | 55·29 | 32 | 20 | 41·2 |
| 32 | 3·5 | 12·1 | ... | ... | 8·396 | 13·310 | 6 | 47 | 58·47 | 32 | 11 | 32·1 |

TABLE IV.—*continued.*

| Oxford. | | | B.D. | | Standard Co-ordinates. 1900·0. | | R.A. 1900·0. | | | Dec. 1900·0. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Diam. | Mag. | No. | Mag. | ξ'. | η'. | | | | | | |
| | | | ° | | R.I. | R.I. | h | m | s | ° | ′ | ″ |
| 33 | 8 | 11·0 | ... | ... | 8·490 | 13·760 | 6 | 48 | 0·66 | 32 | 13 | 47·1 |
| 34 | 4·5 | 11·8 | ... | ... | 8·523 | 14·688 | 6 | 48 | 1·40 | 32 | 18 | 25·5 |
| 35 | 3 | 12·2 | ... | ... | 8·563 | 14·553 | 6 | 48 | 2·35 | 32 | 17 | 45·1 |
| 36 | 5 | 11·6 | ... | ... | 8·824 | 15·370 | 6 | 48 | 8·49 | 32 | 21 | 50·3 |
| 37 | 19·5 | 9·4 | .. | ... | 8·853 | 14·093 | 6 | 48 | 9·23 | 32 | 15 | 27·3 |
| 38 | 17 | 9·7 | ... | ... | 8·864 | 16·392 | 6 | 48 | 9·39 | 32 | 26 | 56·9 |
| 39 | 6·5 | 11·3 | ... | ... | 8·928 | 14·059 | 6 | 48 | 11·00 | 32 | 15 | 17·1 |
| 40 | 8·5 | 10·9 | .. | ... | 8·929 | 13·766 | 6 | 48 | 11·04 | 32 | 13 | 49·2 |
| 41 | 8 | 11·0 | ... | ... | 9·042 | 15·782 | 6 | 48 | 13·63 | 32 | 23 | 54·0 |
| 42 | 23·5 | 9·0 | 33, 1429 | 8·9 | 9·067 | 22·793 | 6 | 48 | 13·93 | 32 | 58 | 57·0 |
| 43 | 7 | 11·2 | ... | ... | 9·175 | 13·832 | 6 | 48 | 16·86 | 32 | 14 | 9·2 |
| 44 | 6·5 | 11·3 | .. | ... | 9·176 | 12·993 | 6 | 48 | 16·91 | 32 | 9 | 57·5 |
| 45 | 5 | 11·6 | ... | ... | 9·185 | 13·965 | 6 | 48 | 17·09 | 32 | 14 | 49·1 |
| 46 | 3 | 12·2 | ... | ... | 9·386 | 12·073 | 6 | 48 | 21·91 | 32 | 5 | 21·5 |
| 47 | 3·5 | 12·1 | ... | ... | 9·387 | 12·593 | 6 | 48 | 21·91 | 32 | 7 | 57·5 |
| 48 | 6 | 11·4 | ... | ... | 9·437 | 12·806 | 6 | 48 | 23·08 | 32 | 9 | 1·4 |
| Nova | 80 | 4·8 | .. | ... | 9·524 | 14·152 | 6 | 48 | 25·07 | 32 | 15 | 57·5 |
| 49 | 28 | 8·5 | 32, 1437 | 8·0 | 9·538 | 18·331 | 6 | 48 | 25·30 | 32 | 36 | 38·9 |
| 50 | 29 | 8·4 | 31, 1438 | 8·8 | 9·696 | 5·266 | 6 | 48 | 29·41 | 31 | 31 | 19·6 |
| 51 | 21 | 9·2 | 31, 1437 | 9·4 | 9·718 | 1·854 | 6 | 48 | 30·02 | 31 | 14 | 17·1 |
| 52 | 7 | 11·2 | ... | ... | 9·785 | 14·150 | 6 | 48 | 31·27 | 32 | 15 | 44·8 |
| 53 | 4·5 | 11·8 | ... | ... | 9·987 | 14·448 | 6 | 48 | 36·04 | 32 | 17 | 14·3 |
| 54 | 15 | 9·9 | ... | ... | 10·052 | 12·079 | 6 | 48 | 37·62 | 32 | 5 | 23·6 |
| 55 | 8 | 11·0 | .. | ... | 10·322 | 13·550 | 6 | 48 | 43·98 | 32 | 12 | 44·9 |
| 56 | 3 | 12·2 | ... | ... | 10·386 | 14·233 | 6 | 48 | 45·48 | 32 | 16 | 9·8 |
| 57 | 9 | 10·8 | ... | ... | 10·411 | 13·471 | 6 | 48 | 46·08 | 32 | 12 | 21·2 |
| 58 | 14 | 10·1 | ... | ... | 10·527 | 12·543 | 6 | 48 | 48·83 | 32 | 7 | 42·9 |
| 59 | 29 | 8·4 | 31, 1442 | 8·6 | 10·667 | 9·528 | 6 | 48 | 52·16 | 31 | 52 | 38·4 |
| 60 | 12 | 10·4 | ... | ... | 10·704 | 12·188 | 6 | 48 | 53·01 | 32 | 5 | 56·4 |
| 61 | 27·5 | 8·6 | 31, 1443 | 8·6 | 10·921 | 2·158 | 6 | 48 | 58·15 | 31 | 15 | 47·5 |
| 62 | 3 | 12·2 | ... | ... | 11·217 | 15·516 | 6 | 49 | 5·14 | 32 | 22 | 34·8 |
| 63 | 19 | 9·4 | ... | ... | 11·221 | 23·756 | 6 | 49 | 5·27 | 33 | 3 | 46·1 |
| 64 | 5 | 11·6 | ... | ... | 11·296 | 12·665 | 6 | 49 | 6·99 | 32 | 8 | 19·5 |
| 65 | 13 | 10·2 | ... | .. | 11·475 | 13·741 | 6 | 49 | 11·23 | 32 | 13 | 42·3 |
| 66 | 4·5 | 11·8 | ... | ... | 11·547 | 14·954 | 6 | 49 | 12·94 | 32 | 19 | 46·1 |
| 67 | 5 | 11·6 | ... | ... | 11·565 | 12·690 | 6 | 49 | 13·34 | 32 | 8 | 26·9 |
| 68 | 6 | 11·4 | ... | ... | 11·651 | 13·728 | 6 | 49 | 15·39 | 32 | 13 | 38·3 |

TABLE IV.—*continued.*

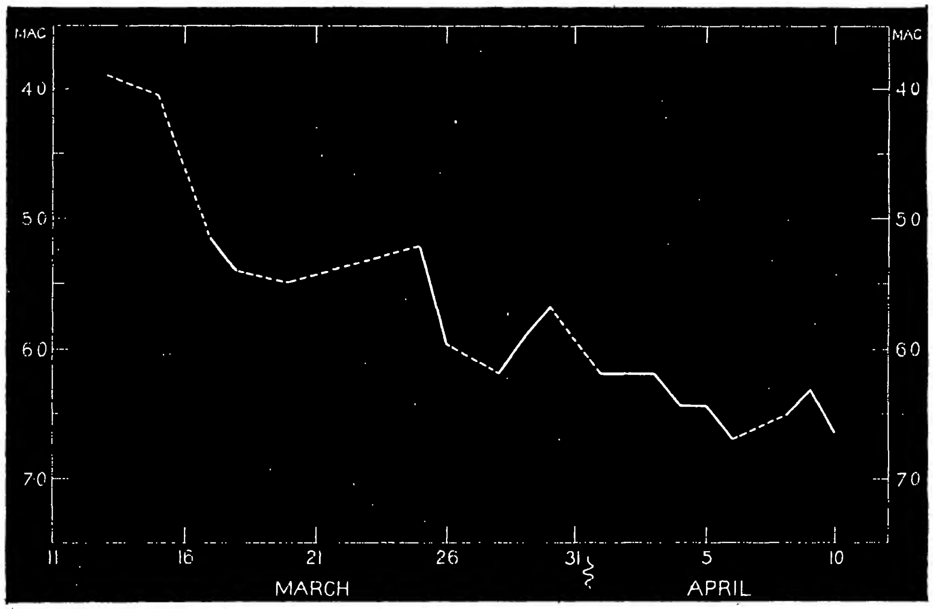
| Oxford. No. | Oxford. Diam. | Oxford. Mag. | B.D. No. | B.D. Mag. | Standard Co-ordinates 1900·0. ξ′. | Standard Co-ordinates 1900·0. η′. | R.A. 1900·0. h | m | s | Dec. 1900·0. ° | ′ | ″ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° | | R.I. | R.I. | h | m | s | ° | ′ | ″ |
| 69 | 23 | 9·0 | ... | ... | 11·678 | 21·923 | 6 | 49 | 16·15 | 32 | 54 | 36·6 |
| 70 | 7 | 11·2 | ... | ... | 11·688 | 14·017 | 6 | 49 | 16·27 | 32 | 15 | 5·0 |
| 71 | 5 | 11·6 | ... | ... | 11·694 | 12·246 | 6 | 49 | 16·38 | 32 | 6 | 13·7 |
| 72 | 18·5 | 9·5 | 31, 1446 | 8·8 | 11·764 | 8·057 | 6 | 49 | 17·97 | 31 | 45 | 17·0 |
| 73 | 19·5 | 9·4 | 32, 1439 | 9·5 | 11·801 | 18·187 | 6 | 49 | 19·01 | 32 | 35 | 56·0 |
| 74 | 10 | 10·7 | ... | ... | 11·916 | 13·959 | 6 | 49 | 21·66 | 32 | 14 | 47·6 |
| 75 | 10·5 | 10·6 | ... | ... | 12·055 | 12·740 | 6 | 49 | 24·92 | 32 | 8 | 41·9 |
| 76 | 14 | 10·1 | ... | ... | 12·196 | 17·529 | 6 | 49 | 28·37 | 32 | 32 | 38·4 |
| 77 | 9 | 10·8 | ... | ... | 12·416 | 17·641 | 6 | 49 | 33·59 | 32 | 33 | 11·9 |
| 78 | 6·5 | 11·3 | ... | ... | 12·439 | 17·271 | 6 | 49 | 34·13 | 32 | 31 | 20·9 |
| 79 | 6 | 11·4 | ... | ... | 12·448 | 17·470 | 6 | 49 | 34·34 | 32 | 32 | 20·6 |
| 80 | 17 | 9·7 | 32, 1440 | 9·2 | 12·588 | 17·349 | 6 | 49 | 37·66 | +32 | 31 | 44·3 |
| 81 | 25·5 | 8·8 | 32, 1441 | 8·7 | 12·727 | 11·298 | 6 | 49 | 40·73 | 32 | 1 | 29·0 |
| 82 | 29·5 | 8·4 | 32, 1442 | 8·6 | 13·003 | 17·917 | 6 | 49 | 47·52 | 32 | 34 | 34·5 |
| 83 | 15 | 9·9 | ... | ... | 13·008 | 17·904 | 6 | 49 | 47·60 | 32 | 34 | 30·6 |
| 84 | 20 | 9·3 | 31, 1448 | 9·2 | 13·086 | 4·153 | 6 | 49 | 48·89 | 31 | 25 | 45·4 |
| 85 | 21·5 | 9·2 | 32, 1443 | 9·2 | 13·315 | 18·387 | 6 | 49 | 54·96 | 32 | 36 | 55·3 |
| 86 | 23·5 | 9·0 | 33, 1431 | 9·2 | 13·379 | 22·705 | 6 | 49 | 56·70 | 32 | 58 | 30·3 |
| 87 | 30·5 | 8·3 | 31, 1449 | 8·3 | 14·310 | 5·182 | 6 | 50 | 17·64 | 31 | 30 | 53·2 |
| 88 | 21 | 9·2 | 32, 1445 | 9·5 | 14·268 | 21·711 | 6 | 50 | 17·82 | 32 | 53 | 31·5 |
| 89 | 31·5 | 8·2 | 32, 1447 | 8·3 | 15·060 | 16·052 | 6 | 50 | 36·18 | 32 | 25 | 13·3 |
| 90 | 28·5 | 8·5 | 31, 1453 | 8·5 | 16·588 | 3·168 | 6 | 51 | 10·84 | 31 | 20 | 46·3 |
| 91 | 18·5 | 9·5 | 31, 1455 | 9·2 | 16·598 | 10·788 | 6 | 51 | 11·98 | 31 | 58 | 52·1 |
| 92 | 30·5 | 8·3 | 33, 1438 | 9·0 | 17·181 | 23·118 | 6 | 51 | 27·37 | 33 | 0 | 29·6 |
| 93 | 32 | 8·1 | 31, 1457 | 8·5 | 17·940 | 5·783 | 6 | 51 | 42·88 | 31 | 33 | 48·4 |
| 94 | 16·5 | 9·8 | 32, 1449 | 9·3 | 18·191 | 17·045 | 6 | 51 | 50·50 | 32 | 30 | 6·3 |
| 95 | 24·5 | 8·9 | 32, 1450 | 9·0 | 18·338 | 19·631 | 6 | 51 | 54·40 | 32 | 43 | 1·7 |
| 96 | 17·5 | 9·7 | 32, 1451 | 9·5 | 19·326 | 12·505 | 6 | 52 | 16·61 | 32 | 7 | 22·0 |
| 97 | 18·5 | 9·5 | 31, 1459 | 9·5 | 19·835 | 1·469 | 6 | 52 | 26·55 | 31 | 12 | 10·6 |
| 98 | 24·5 | 8·9 | 31, 1460 | 9·2 | 20·629 | 4·396 | 6 | 52 | 45·72 | 31 | 26 | 46·5 |
| 99 | 40 | 7·4 | 33, 1446 | 8·0 | 21·133 | 25·375 | 6 | 53 | 2·12 | 33 | 11 | 37·3 |
| 100 | 20 | 9·3 | 32, 1453 | 9·4 | 21·493 | 17·114 | 6 | 53 | 8·83 | 32 | 30 | 18·8 |
| 101 | 19 | 9·4 | 31, 1463 | 9·3 | 22 052 | 8·876 | 6 | 53 | 20·13 | 31 | 49 | 6·3 |
| 102 | 18·5 | 9·5 | 31, 1466 | 9·4 | 23·988 | 1·804 | 6 | 54 | 3·76 | 31 | 13 | 39·1 |

*University Observatory, Oxford :*
1912, *April* 10.

## *Observations of the New Star in Gemini made at the Radcliffe Observatory, Oxford.*

(*Communicated by Arthur A. Rambaut, M.A., Sc.D., F.R.S., Radcliffe Observer.*)

The Kiel telegram announcing the discovery of this star was received on March 13, and since then observations of its brightness have been made at the Radcliffe Observatory on every evening when the weather permitted. On the 13th, unfortunately, some time was lost in consequence of a mistake in the telegram which stated that the new star was situated in the neighbourhood of $\eta$ Geminorum, and by the time the error was discovered by Mr. Barrett and the star had been picked up near $\theta$, a short break in




Magnitudes of Nova Geminorum No. 2.

an overcast sky began to close up, and thus an exact determination of brightness became impossible.

From the date of discovery up till March 25 the observations of magnitude were made with the naked eye, and afterwards with the 2·7-inch finder (power 13) of the 10-inch Barclay equatorial. Observations of the colour and character of the image, as described in Mr. Robinson's notes of March 25 and subsequent dates, were made chiefly with the 10-inch refractor (power 85), and on one occasion with the 18-inch refractor (power 290).

In Table I. below are given the reference numbers, the names of the stars used for comparison, and the Harvard magnitudes on which our estimates are based. This is followed by the separate estimations of magnitudes and the observers' remarks; whilst Table II. gives for each evening the mean result obtained by each observer.