

observed at both the Upper and Lower Culmination, and some of them by Reflection, thus bringing into requisition almost every section of the Circle Divisions. The observations in detail will soon be published. The value of  $g$ , resulting from 177 observations of this last series is

Morrison Observatory Glasgow Mo. 1884 Sept. 2.

$$g = 39^{\circ} 13' 45''.59 \pm 0''.05$$

agreeing exactly with the determination of 1877, and showing that the observations of that year were, aside from constant error, well made.

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### Duplicity of the small star preceding $\beta$ Capricorni.

On Nov. 6<sup>th</sup> 1883 I witnessed the occultation of a small 7<sup>th</sup> magnitude star (preceding  $\beta$  Capricorni on the same parallel) by the moon: from the manner of disappearance I detected its duplicity, and estimated the light of the smaller star — the following component — at 10<sup>th</sup> magnitude and the distance probably 0''.7.

At my request Mr. Burnham examined the star with the 18 $\frac{1}{2}$  inch at the Dearborne Observatory Chicago, but from the rather unfavorable situation of the star he was unable to separate it. When again favorably situated this year Mr. Burnham and Prof. Hough again examined it and found it to be a fine double of the first class. Mr. Burnham very

kindly sent me his measures which from the mean of three give:

$$P = 105^{\circ}8$$

$$D = 0''.85$$

$$\text{Epoch} = 1884.59, \text{ Magnitude } 7 \text{ and } 9.$$

Prof C. A. Young at Princeton has also measured it with the 23 inch of the Halstead Observatory, but I have not at present his measures which will doubtless soon be published. Prof. Swift has also separated it with 16 inches.

I have previously announced the discovery of this object (before any telescope had yet separated it) in *Astr. Nachr.*

Vanderbilt University Observatory, Nashville, Tenn. U. S. A.

*E. E. Barnard.*

### Cordoba Observations of the Comet 1881 IV.

I have just received from Dr. Carl Stechert his dissertation upon a definite determination of the orbit of the Comet 1881 IV, previously published in the *Astr. Nachr.* No. 2580; and my attention has been attracted by, what I had not before noticed, the extraordinary magnitude of the probable error, deduced by the author, for the Cordoba right-ascensions. A single glance at the series of comparisons of the observations with the ephemeris shows the explanation; for the right-ascensions of Oct. 6 and 7 are both of them about two seconds of time less than they should be, both by the evidence of the remainder of the series, and by that of other southern observatories.

Reference to the original publication (*A. N.* 101, 139) exhibits quite a sufficient number of errors, although they are fortunately easy of recognition and correction. The declination of the second comparison-star of Oct. 5 is 1' too large; and, what is still less excusable, the positions given for the stars are not the mean places for 1881, as they purport to be, but are the apparent places at the date.

The Cordoba determinations are thirteen in number, made upon eight different nights, after which a fortnight of cloudy weather prevented the comet from being again seen. The great discordance of those of Oct. 6 and 7 is manifestly not due to errors of observation, for it is more than a dozen times larger than the probable error deducible from the rest of the series, is essentially the same on both nights, and the observers on these nights were different.

A careful repetition of the computations has failed to

disclose the origin of this discordance. The agreement of the several comparisons with their mean is entirely satisfactory, and quite as good as should be expected for an object so faint and diffuse as the Comet then was. There were ten comparisons on each night; the mean error of a single comparison being  $\pm 0''.60$  on Oct. 6 and  $\pm 0''.48$  on Oct. 7, which correspond respectively to the probable errors  $\pm 0''.13$  and  $\pm 0''.11$  for the adopted difference of the right-ascensions of Comet and Star.

I can think of only one reasonable explanation for such a strange discordance, if it can be made certain that no error exists in the computations. This, — which seems to find some corroboration in the agreement between the results obtained by Mr. Davis, Oct. 6, and those of Mr. Wiggin, Oct. 7, — is that a different point in the Comet was used on these nights from that previously taken to represent the center of gravity. Such diversity in the part observed must unquestionably have occurred to a considerable extent for the great Comet 1882 II, when its nucleus disintegrated, and most of the fragmentary portions gradually disappeared. It may have taken place here, for the discordance does not seem to be due to any error in the reductions.

The comparison-stars of Sept. 29 were determined on the meridian, a few months afterward; and in view of the shortness of the series, I take the liberty of sending you the whole in its revised form for republication. All the star-places except the first three have been determined here;