ASTRONOMISCHE NACHRICHTEN.

N^o 3072.

Observations of the Difference of Declination of 21 Asterope and 22 Asterope, at the Transit of Wolf's Comet 1891 Sep. 3.

By *E. E. Barnard.*

September 3 of this year, Wolf's Periodic comet in passing through the Pleiades, transitted the seventh magnitude star 21 Asterope.

This affording an excellent opportunity to test the question of the refractive power of cometary matter, Mr. Burnham and I decided to make a series of measures of the difference of declination of this star and its neighbor south following, 22 Asterope. These measures were made before, during and after the transit of the comet over Asterope.

Mr. Burnham's measures were made with the filar micrometer of the 36 inch. equatorial and mine with that of the 12 inch.

Neither of us knew the time of nearest approach except very approximately.

Mr. Burnham's measures show a very small change in the difference of declination. This change, however, indicated by Mr. Burnham's measures, is so small that it would be wholly masked in the errors of observation with the smaller telescope — notwithstanding the small probable error indicated by the measures with that instrument.

I have tabulated here the measures made with both instruments, and Mr. Burnham has plotted his measures on a diagram which will show better the variation in the measures than any mere tabulation could do.

I measured the position of the comet with the 12 inch with reference to 21 Asterope before and after the transit.

These observations give

Before Transit.

1891 Sep. 3^d 11^h 24^m 35^s Mt. Hamilton M. T.

$$\text{— } x \Delta\alpha = -0^m 20^s 82$$

$$\text{— } x \Delta\delta = +2' 21''.3$$

After Transit.

1891 Sep. 3^d 16^h 9^m 48^s Mt. Hamilton M. T.

$$\text{— } x \Delta\alpha = +0^m 3^s 56$$

$$\text{— } x \Delta\delta = -0' 43''.9$$

From these, it would appear that the nearest approach of nucleus and star occurred at 15^h 15^m 3^s Mt. Hamilton M. T. or 2^h 8^m 7^s sidereal time, when the distance between the two was 9".2.

Previous to the observations, I had estimated the diameter of the head at $\frac{3}{4}'$ to 1'. Hence the star was well immersed in the nebulosity.

When nearest Asterope, the comet was wholly invisible in both telescopes.

The time required for the comet to pass the star with its interposing nebulosity would be considerably less than half an hour.

In tabulating Mr. Burnham's measures I have used his individual settings six minutes on each side of the time of conjunction. His other measures before and after these are the means of three settings each. I have indicated this by displacing into a second column the individual readings.

My own measures, as they show no such peculiarity as do Mr. Burnham's, I have tabulated in means of three each.

The observations are all corrected for refraction.

Observed Difference of Declination 21 Asterope and 22 Asterope at the transit of Wolf's Comet 1891 Sept. 3.
From measures with the 36 inch. Refractor by S. W. Burnham.

In the diagram by Mr. Burnham, the white circles indicate individual measures, six minutes on each side of the time of conjunction, while the black ones are the means of three observations each.

The vertical line corresponds to the time of nearest approach of the nucleus to Asterope, and the horizontal one is drawn through the mean $\Delta\delta$ derived from Dr. Elkin's measures, Mr. Burnham's and my own.

For comparison, I append the $\Delta\delta$ from Dr. Elkin's measures with the heliometer.

Elkin $\Delta\delta = 94^{\circ}79$ 6 inch. heliometer

Burnham $= 94.90$ 36 inch. equatorial

Barnard $= 94.89$ 12 inch. equatorial

From this are omitted Mr. Burnham's measures at nearest approach i. e. those represented by white circles in the diagram.

Difference of Declination between 21 Asterope and 22 Asterope.

Sidereal Time	β (36 in.) means	β (36 in.) indiv. read.
0 ^h 0 ^m	95 ^o 06	—
	94.97	—
	95.07	—
	94.95	—
2 1.5	—	95 ^o 07
2.5	—	94.60
3.5	—	94.95
4.5	—	95.06
5.5	—	95.15
6.5	—	94.88
7.5	—	94.77
8.5	—	94.64
9.5	—	94.86
10.5	—	94.75
2 11.5	—	94.79

Mt. Hamilton 1891 Oct. 10.

Sidereal Time	β (36 in.) means	β (36 in.) indiv. read.
2 ^h 12 ^m 5	—	94 ^o 98
14.5	—	94.07
15.5	—	94.87
16.5	—	95.17
17.5	—	95.12
20.5	94 ^o 78	—
2 23.0	94.82	—

Sidereal Time	B (12 in.)
1 ^h 15 ^m	94 ^o 89
19	94.90
51.7	95.01
1 55.7	94.96
2 0.1	94.89
3.5	94.91
6.3	94.80
9.5	95.03
12.8	95.03
16.2	94.95
20.5	94.83
24.8	94.83
28.0	94.83
35.0	94.73
2 45.0	94.86

E. E. Barnard.

Beobachtungen der totalen Mondfinsterniss 1891 Nov. 15.

Auf dem Haynald-Observatorium in Kalocsa.

Die Beobachtung der Mondfinsterniss am 15. Nov. wurde in Kalocsa durch schlechtes Wetter fast vollständig vereitelt. Beim Eintritt des Mondes zogen Wolken vorüber und gestatteten nur in Zwischenräumen zu beobachten. Als die totale Finsterniss begann, war der Mond schon von dichten Wolken bedeckt und es begann zu regnen. Nach ungefähr einer Stunde trat der verfinsterte Mond aus den Wolken, es war schon gegen Ende der Finsterniss. Der Mond war in orange-rothem Lichte sehr hell sichtbar. Die Sternbedeckungen, zu deren Beobachtung alle Vorbereitungen getroffen waren, gingen alle verloren. Beim Austritt zogen ebenfalls zeitweilig Wolken vorüber.

Die Schattenantritte nach vorgelegtem Programm, das wir erst am Vortage erhielten, wurden am 7-Zöller (Vergrößerung 47) von mir und am 4¹/₂-Zöller vom Assistenten beobachtet. Meinen Beobachtungen, die sich auf die Antritte des Kernschattens beziehen, schreibe ich mindere Genauigkeit zu.

Die von mir notirten Zeiten sind:

Kalocsa 1891 Nov. 21.

M. Z. Berlin

	Eintritt	Austritt
Plato 1. Rand	11 ^h 47 ^m 26 ^s 4	14 ^h 27 ^m 18 ^s
» 2. »	48 13.4	—
Kepler	42 48	—
Menelaus Mitte	11 58 6	—

Am 4¹/₂-Zöller wurde mit Vergr. 35 vom Assistenten *J. Schreiber* beobachtet. Es wurde nur dann beobachtet, wenn der Himmel ganz rein zu sein schien, und diejenige Stelle des Schattensaumes aufgefasst, wo der Schattenübergang den grössten Sprung zu machen schien.

Folgende Eintritte wurden von ihm notirt:

M. Z. Berlin

Copernicus 1. Rand	11 ^h 43 ^m 39 ^s 4
» 2. »	45 27.4
Plato 1. Rand	45 51.4
» 2. »	47 9.4
Manilius Mitte	56
Menelaus Mitte	11 59 9.4

J. Fényi, S. I.