A and D compared.

| Date | Pos. Ang. | Nr. Comparis. | Wt. | Date | Dist. | Nr. Comparis. | Wt. | Mean results by weights |
|---|---|---|---|---|---|---|---|---|
| 1878.192 | 158°16 | 3 | 3 | | | | | |
| „ 200 | 159.30 | 4 | 4 | 1878.200 | 102.93 | 4 | 4 | 1878.210 p=158°39 |
| „ 203 | 157.95 | 5 | 4 | „ 203 | 103.47 | 4 | 4 | 1858.213 d=103″11 |
| „ 219 | 158 95 | 2 | 3 | | | | | |
| „ 236 | 157.69 | 6 | 4 | „ 236 | 102 96 | 5 | 5 | |

Morrison Observatory, Glasgow, Missouri, May 1878 *C. W. Pritchett.*

## Observations of the transit of Mercury, 1878, May. 5—6 made at Washington.

By *D. P. Todd.*

(Communicated by Rear Admiral John Rodgers, U. S. Navy, the Superintendent of the Naval Observatory.)

The conditions for observing the transit of Mercury at Washington were exceptionally favorable. The reduced Washington mean times of my observations of the contacts are as follow:

The first (external) contact, Mai 5 $22^h\ 4^m55^s4$ $\pm 5^s$ Wt. 2
The second (internal) contact, 22. 7.39.3 ±1 Wt. 4
The third (internal) contact, Mai 6 5.33 49.7 ±3 Wt. 3
The fourth (external) contact, 5.36.44.7 ±4 Wt. 2

A magnifying power of 180 diameters was employed. Weight 5 would indicate a perfect observation. The observed phases correspond to the diagrams represented at „external contact“ and „internal contact“ in figure 2 of Professor Newcomb's Instructions for observing the transit of Mercury, issued by the Naval Observatory. The appearance of these disks at a distance of half a mile had been carefully studied before the transit. It is, therefore, believed that the times above given are those of geometric contact, with as great a degree of accuracy as the weights and probable errors assigned indicate. No hesitation, distortion, nor black drop was observed at any of the contacts.

No light spot was observed on the disk of Mercury — either white or any other color. The disk appeared of a uniform jet blackness throughout. No indication of an atmosphere surrounding the planet was remarked. the limb of the planet was very sharply defined all around.

A systematic search for a possible satellite of Mercury was maintained at suitable intervals during the time of the transit. Moments of favorable definition were chosen for the employment of a magnifying power so high that a satellite having a diameter so large as forty miles could not have escaped detection. Assuming Encke's mass of Mercury, $\frac{1}{4866000}$th that of the sun, a satellite having a period of twenty-four hours would have had a maximum elongation of 43″ from the centre of the planet — the logarithm of the true distance of Mercury from the earth being 9.747; while a satellite with a period of thirty days would have had a maximum elongation of 412″. As the transit of Mercury was so nearly central, a satellite having a period which it would seem reasonable to assume must have been projected on the disk of the sun. If, however, any such object exists, it would be much more readily detected by the solar light which it would reflect.

The observations were all made with a Clark Equatorial refractor of five inches aperture. The number of the instrument is 860. The aperture was not reduced. The instrument is furnished with a double-image micrometer, of the Airy pattern as modified by Valz. This was employed in a series of measures of diameters of the planet. The results of the measures are as follow:

| Position angle of diameter measured | Diameter |
|---|---|
| 357°—177° | 11″88 |
| 357.—177 | 11.80 |
| 7.—187 | 11.88 |
| 17.—197 | 11.81 |
| 27.—207 | 11.80 |
| 37.—217 | 11.87 |
| 47.—227 | 11.81 |
| 57.—237 | 11.86 |
| 67.—247 | 11.85 |
| 77.—257 | 11.88 |
| 87.—267 | 11.80 |
| Mean, | 11.84 |

There would seem to be no evidence of ellipticity of the planet from these measures. Each result in the column „Diameter" is given by the mean of three separate measures of double-diameter of the planet. The value of one rotation of the micrometer screw was determined by the measurement of a white disk of about two feet diameter, on a back-ground of jet blackness. The disk was placed at a distance of about 3080 feet.

The distance of Mercury from the earth at the mean epoch of the measures being [9.7465], the mean result, 11″84, gives 6″60 for the diameter of the planet as seen at the distance unity. Assuming a solar parallax of 8″83, the resulting diameter of Mercury is 2964 miles.

The Naval Observatory, Washington, 1878, May 7.

*D. P. Todd.*

---

## Schreiben des Herrn Leonard Waldo an den Herausgeber.

Please make the following corrections to my paper on the Satellites of Mars A. N. 2190:

Outer Satellite (Deimus.)

August $29^d$ $1^h15^m5$ for p = 251°7 read p = 271°7.

Sept. $2^d$ for $2^d$ $0^h50^m1$ read $2^d$ $23^h51^m0$

The distance corresponding to this last date was measured through thin clouds and I am incleaned now to think is not deserving of the confidence of the preceding distance.

Inner Satellite (Phobus.)

Sept. $9^d$ $3^h$ $0^m9$ A rejected observation of distance gives for this date 25″1.

16 1.24.9 A note in the original record says this observation is a doubtful one as it is extremely difficult to distinguish the satellite at all.

Also in my paper immediately following on the observations of Double Stars — the estimated distance of $\mu$ Herculis should be 1″0 instead of 1″8.

Cambridge. U. S., May 15, 1878 *Leonard Waldo.*

---

## Anzeige.

Es ist schon in früheren Bänden bemerkt worden, dass ohne ausdrückliche Bestellung und Vorausbezahlung keine Nummer eines neuen Bandes versandt wird. Die Herren Abonnenten, welche diese Blätter fortzusetzen wünschen, werden also ersucht, um Unterbrechungen zu vermeiden, baldmöglichst ihre Bestellungen einzusenden.

Man pränumerirt bei der Expedition dieses Blattes (Kiel, Königliche Sternwarte) pro Band mit 12 Mark deutscher Reichsmünze, und von diesem Preise wird auch den Buchhandlungen und Postämtern kein Rabatt gegeben, die also nothwendig ihren Abnehmern höhere Preise berechnen müssen. — Ueberhaupt sind alle in dieser Anzeige berechneten Preise Nettopreise.

Für die von der Expedition mit der Post versandten Exemplare ist der Preis pro Band für Deutschland, Oesterreich, Dänemark, Schweden und Russland 15 Mark deutscher Reichsmünze, für England 15 sh., für Frankreich 18 Francs, für Italien 20 Lire, für Nordamerika $3^2/_3$ Dollars, für Holland $1^1/_2$ holländische Ducaten.

Einzelne Nummern werden nur zur Completirung, wenn sie vorräthig sind, zum Preise von 60 Pfennigen abgelassen.

Den Hauptdebit dieses Blattes hat, wie bisher, die Buchhandlung von W. Mauke Söhne in Hamburg.

---

Inhalt:



---

Kiel. 1878. Juli 20. — Druck von C. F. Mohr in Kiel.