Chapter 6
The Original Logbooks: England, France, Germany and Italy

C. Cunningham, *Early Investigations of Ceres and the Discovery of Pallas*,
DOI 10.1007/978-3-319-28815-4_6

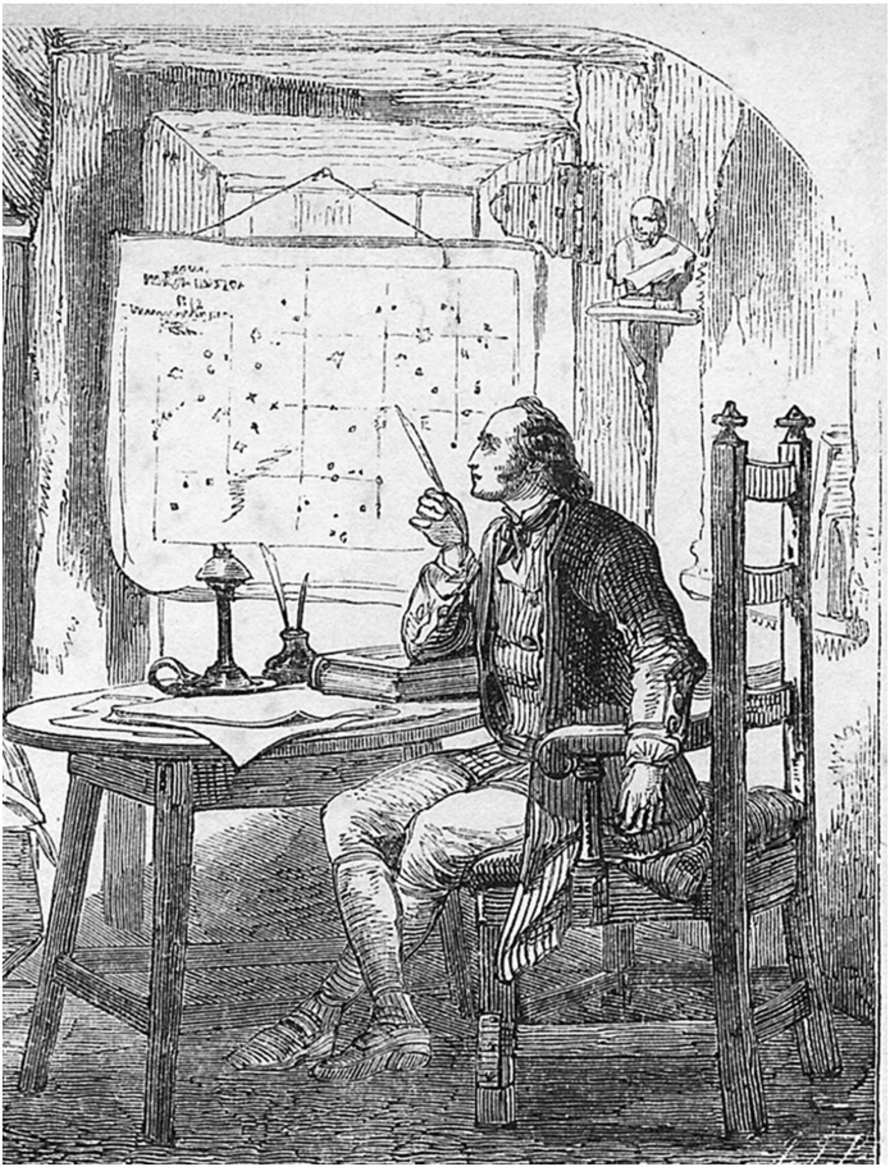


Fig. 6.1 Illustration from *The Village Astronomer*, translated from German by Matilda Wrench (1852). (Wertheim and Macintosh, London). An astronomer with his elbow on a logbook consults a star chart

In the original logbooks of the astronomers in England, France, Germany and Italy, we can see the actual observations and calculations being made on the extraordinary new objects, Ceres and Pallas (Fig. 6.1).

Lodged in the archives of the Paris Observatory are the handwritten observations made at the l'Ecole Militaire. In the late eighteenth century and the early nineteenth, the main places devoted to official astronomy in Paris were the Observatoire de Paris, the Observatoire de la Marine and the Observatoire de l'Ecole militaire (Débarbat, 1998). Lalande was the director at the l'Ecole Militaire until his death in 1807, when he was succeeded by Burckhardt (Bigourdan, 1887).

The extract dated January 25, 1802, shows the first observation of Ceres from the observatory (Fig. 6.2). In this entry, it is referred to (in the right-hand column) as Piazzi's planet (Fig. 6.3). This was just 3 weeks after Olbers had announced his recovery of Ceres.

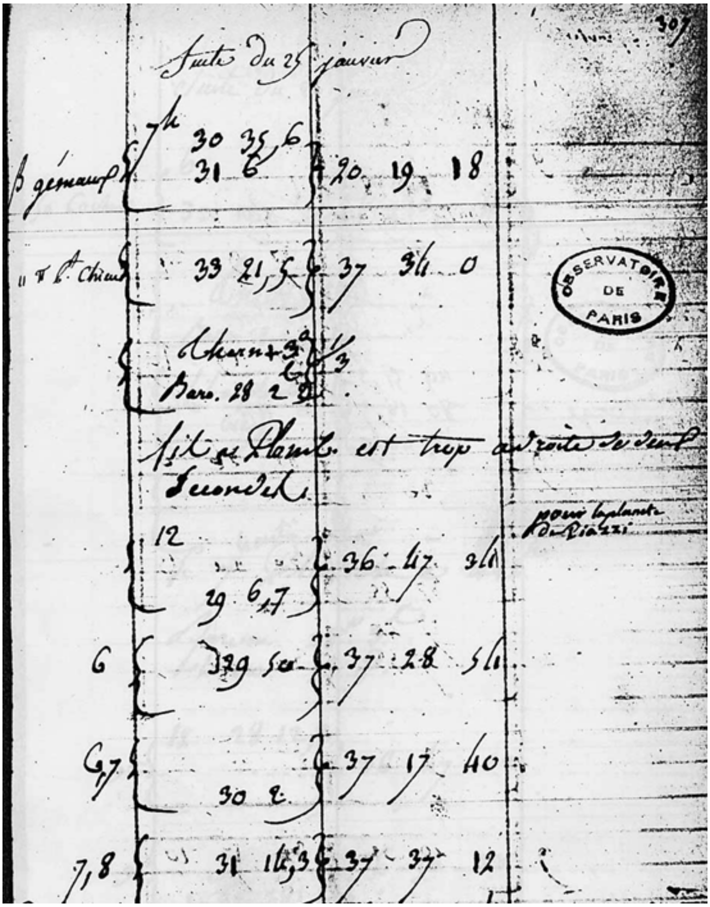


Fig. 6.2 Observations in Paris of 'Piazzi's planet' on January 25, 1802

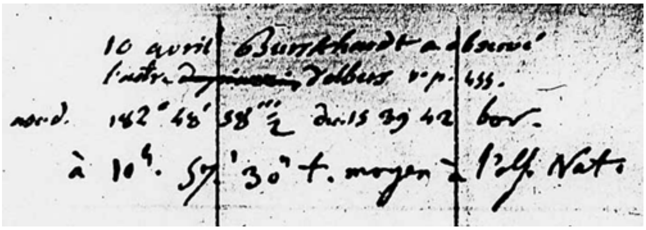


Fig. 6.3 Burckhardt's observations of 'Olbers' star' on April 10, 1802

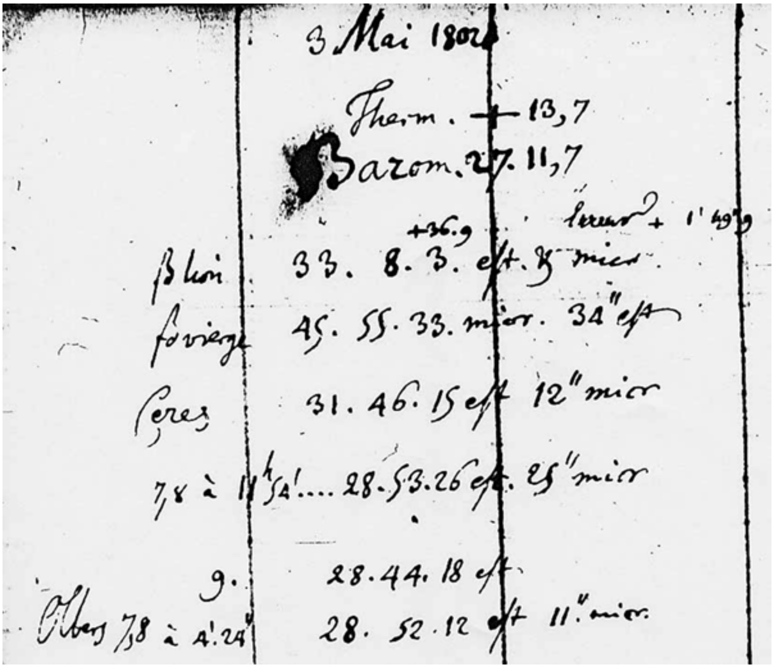


Fig. 6.4 Observations in Paris of Ceres and 'Olbers' on May 3, 1802

Shown below is the first note in the logbook about Pallas. Here, on April 10, 1802, it is referred to as Olbers' star.

On May 3, 1802, we see the first asteroid identified as Ceres, while Pallas is just referred to as Olbers (Fig. 6.4).

The very next night, however, reveals the full gamut of confusion. Ceres reverts to its former designation as Piazzi's planet, Pallas is again called Olbers' star, and Uranus is referred to as Herschel's planet (Fig. 6.5).

This nomenclature comes direct from Lalande, who insisted on attaching the names of the discoverers to the planets.

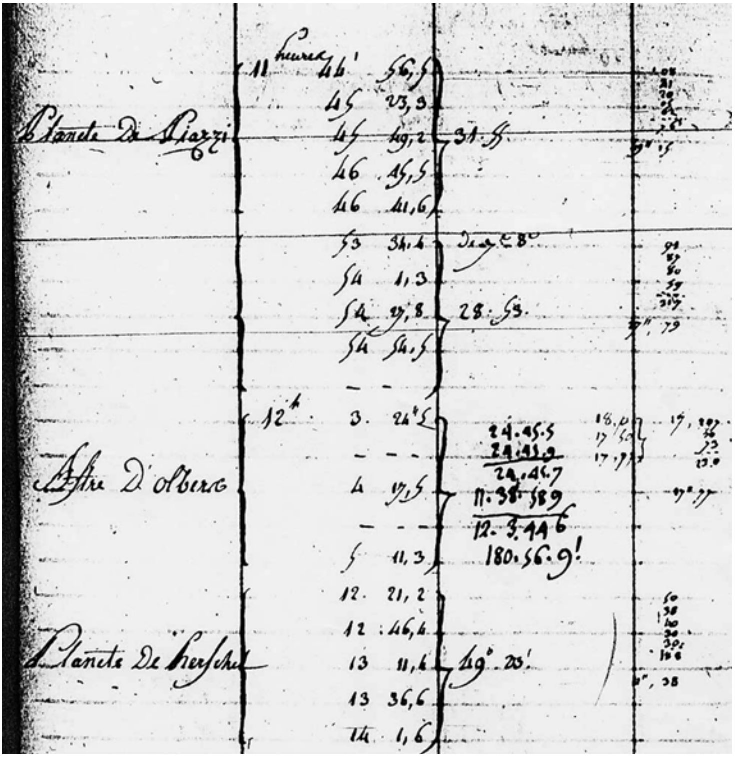


Fig. 6.5 Observations in Paris of 'Piazzi's planet' and 'Olbers' star' on May 4, 1802

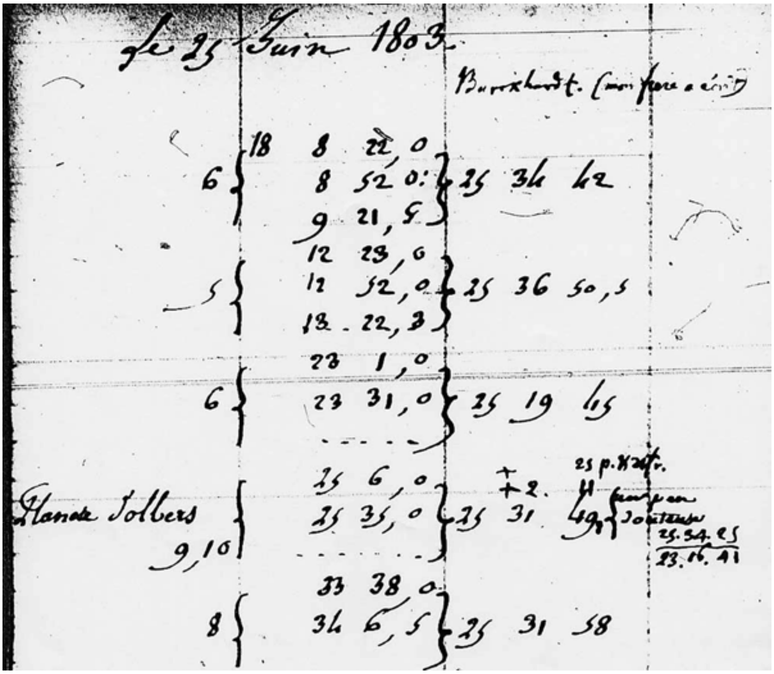
Finally, Pallas was recognized as a planet (Olbers' planet). This did not happen until June 25, 1803. Note also that Burckhardt himself signed this page along the top, firmly identifying the observations as his (Fig. 6.6).

Across the English Channel, in Greenwich, the Astronomer Royal Nevil Maskelyne was also busy observing Ceres and Pallas.

In this detail from his observational logs, we read an entry from April 22, 1802:

> *From the time of Olber's planet passing the meridian till near 11 pm m.t. I looked alternately at this planet and Ceres, and they seemed about equal in brightness. Whichever was observed last was thought to be the brightest. At the transit instrument tonight, Olber's planet seemed equal in size and brightness to* [the way] *Ceres appeared when I observed it at the meridian last night. Mr. Gilpin found that on April 22 and 23 the two new planets Ceres and Pallas appeared to him exactly of equal brightness. The French astronomers on 10th and 12th found the same* (Fig. 6.7).

The relative brightness of Ceres and Pallas was the subject of many measurements by Maskelyne and his assistant, Thomas Firminger (abbreviated as T. F. in the notes): "Observations of the apparent magnitudes or brightness of the two new planets (Fig. 6.8)."

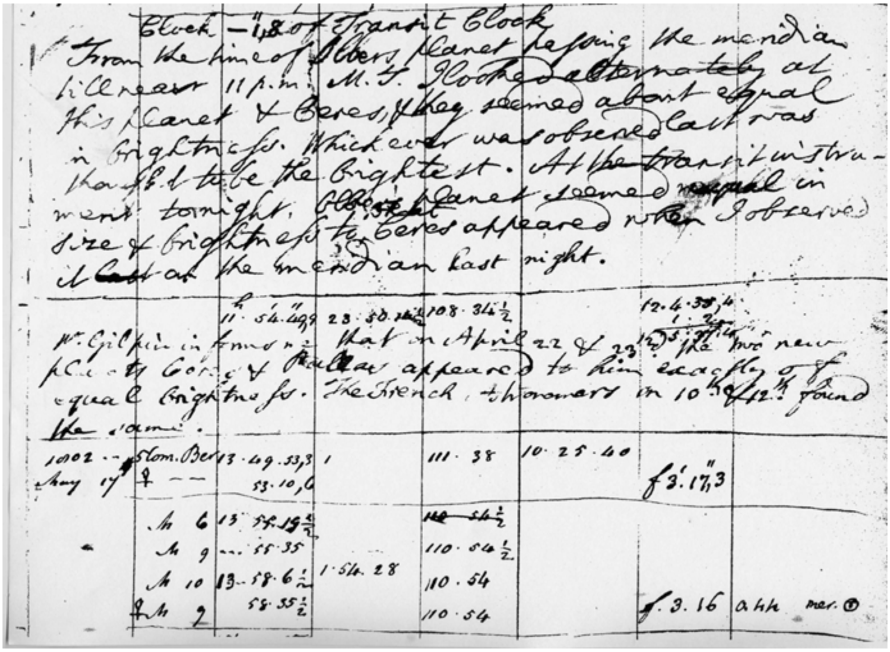


Le 25 Juin 1803

Burckhardt.

Planète d'Olbers

Fig. 6.6 Observations in Paris of 'Olbers planet' on June 25, 1803

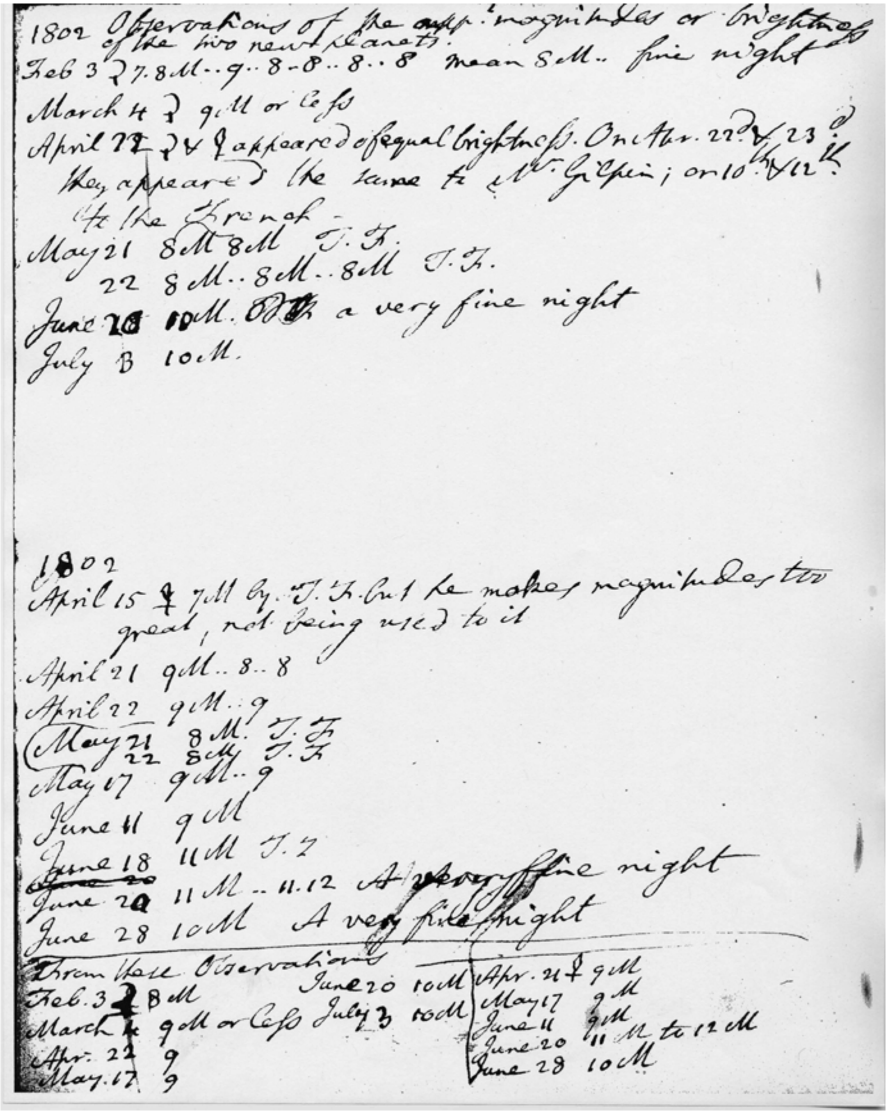


Clock — 1.8 of Transit Clock

From the time of Olbers planet passing the meridian till near 11 p.m. M.T. I looked alternately at this planet & Ceres, & they seemed about equal in brightness. Whichever was observed last was thought to be the brightest. At the transit instrument tonight, Olbers planet seemed equal in size & brightness to Ceres appeared when I observed it at the meridian last night.

Mr. Gilpin informs me that on April 22 & 23 the two new planets Ceres & Pallas appeared to him exactly of equal brightness. The French Astronomers in 10 & 12 ft found the same.

Fig. 6.7 Notes and observations of Pallas by Maskelyne on April 22, 1802


1802 Observations of the app. magnitudes or brightness of the two new planets.
Feb 3 ⚳ 7.8 M .. 9 .. 8–8 .. 8 .. 8 mean 8 M .. fine night
March 4 ⚳ 9 M or less
April 22 ⚳ & ⚴ appeared of equal brightness. On Apr. 22 & 23 they appeared the same to Mr. Gilpin; or 10th & 12th. At the French –
May 21 8 M 8 M T. T.
22 8 M .. 8 M .. 8 M T. T.
June 20 10 M. a very fine night
July 3 10 M.

1802
April 15 ⚴ 7 M by T. T. but he makes magnitudes too great, not being used to it
April 21 9 M .. 8 .. 8
April 22 9 M .. 9
May 21 8 M. T. T.
22 8 M T. T.
May 17 9 M .. 9
June 11 9 M
June 18 11 M T. T.
June 20 11 M .. 11.12 A very fine night
June 28 10 M A very fine night
From these Observations
Feb. 3 ⚳ 8 M
March 4 9 M or less
Apr. 22 9
May 17 9
June 20 10 M
July 3 10 M
Apr. 21 ⚴ 9 M
May 17 9 M
June 11 9 M
June 20 11 M to 12 M
June 28 10 M

Fig. 6.8 Observations of the apparent magnitudes of Ceres and Pallas by Maskelyne. (Cambridge University archives)

Some of the laborious calculations Maskelyne performed to derive the diameter of Pallas to be 116.56 English miles (Fig. 6.9).

This is the calculation of the distance of Pallas from the earth April 22, 1802 at mean midnight in the meridian of Greenwich. I have however taken the planet's longitude for m.t. at midnight in the meridian of Seeberg as great accuracy in the result was not required. The calculation was made from Dr. Gauss' elements (II). By my obs. the long. should be 5h 23°

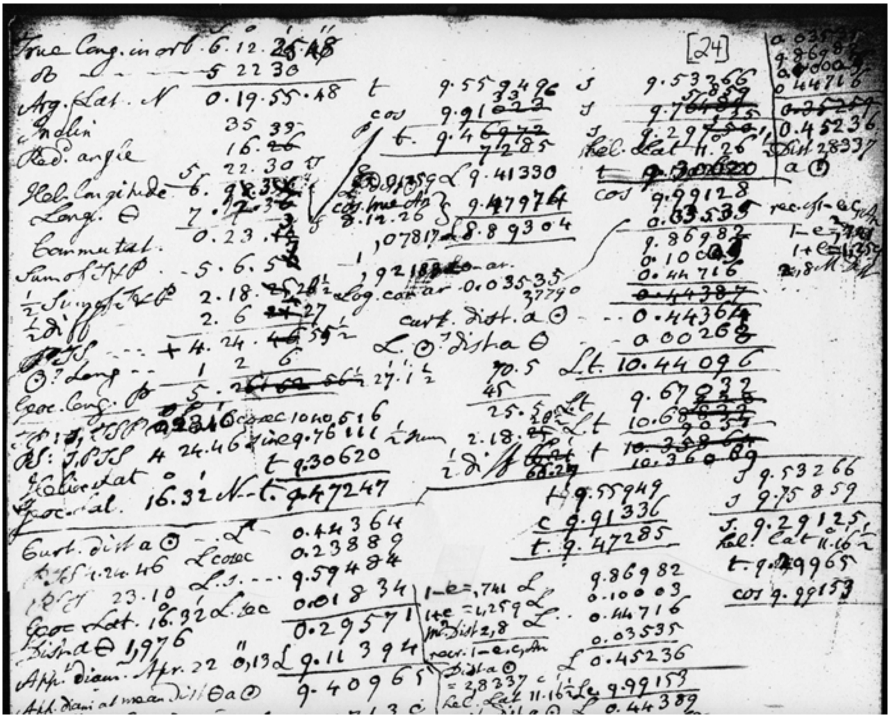


Fig. 6.9 Mathematical calculation of the diameter of Pallas by Maskelyne, June 23, 1802. (Cambridge University archives)

> *43′ Lat 17° 38′ 4″ N. The longitude computed is +2° 44′ and the latitude -1° 6′. The cause of this difference I cannot imagine. June 23, 1802.*

The great Scottish psychologist Thomas Reid (1710–1796; 1785: 265) offered this explanation of ‘apparent magnitude’ in a book dedicated to Dugald Stewart:

> *No sooner is the visible figure and magnitude of an object seen, than immediately we have the conception and belief of the corresponding tangible figure and magnitude. We give no attention to the visible figure and magnitude. They are immediately forgotten, as if they had never been perceived; they have no name in common language; and indeed, until Berkeley pointed them out as a subject of speculation, and gave them a name, they had none among philosophers, excepting in one instance, relating to the heavenly bodies, which are beyond the reach of touch. With regard to them, what Berkeley calls visible magnitude was by astronomers called apparent magnitude.*

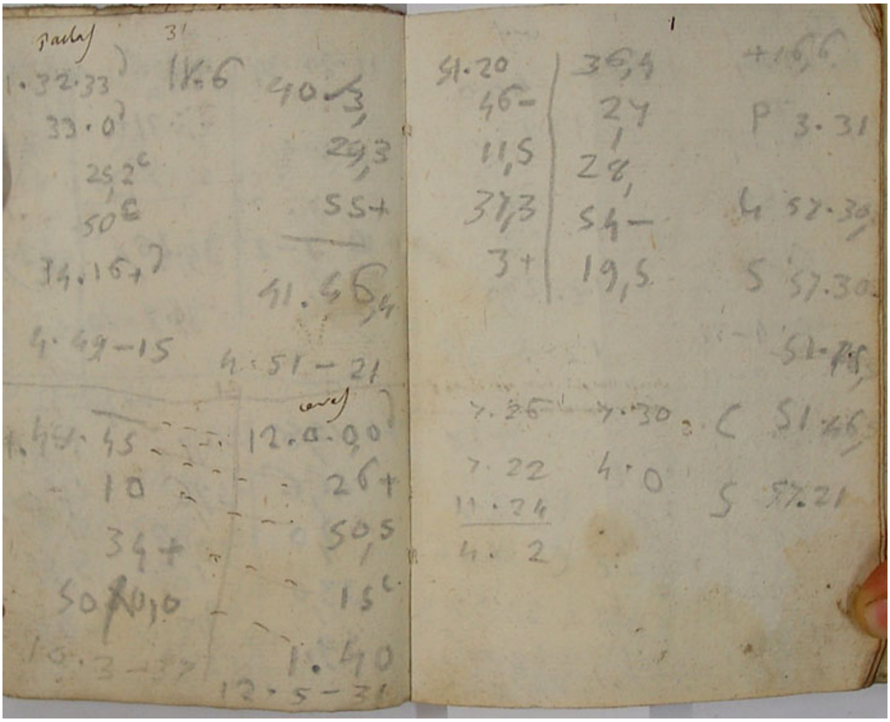


Fig. 6.10 A page from Barnaba Oriani's logbook, with observations of Ceres and Pallas. (Brera Observatory archives)

In Italy, Oriani was making concurrent observations of Ceres and Pallas, as evidenced by this page of his logbook from 1802. On the top left is written "Pallas," with "Ceres" written in black ink below (Fig. 6.10).

In Germany, Gauss was working on the mathematical calculations to determine the orbit of what he writes here as "Ceres Ferdinandea (Fig. 6.11)."

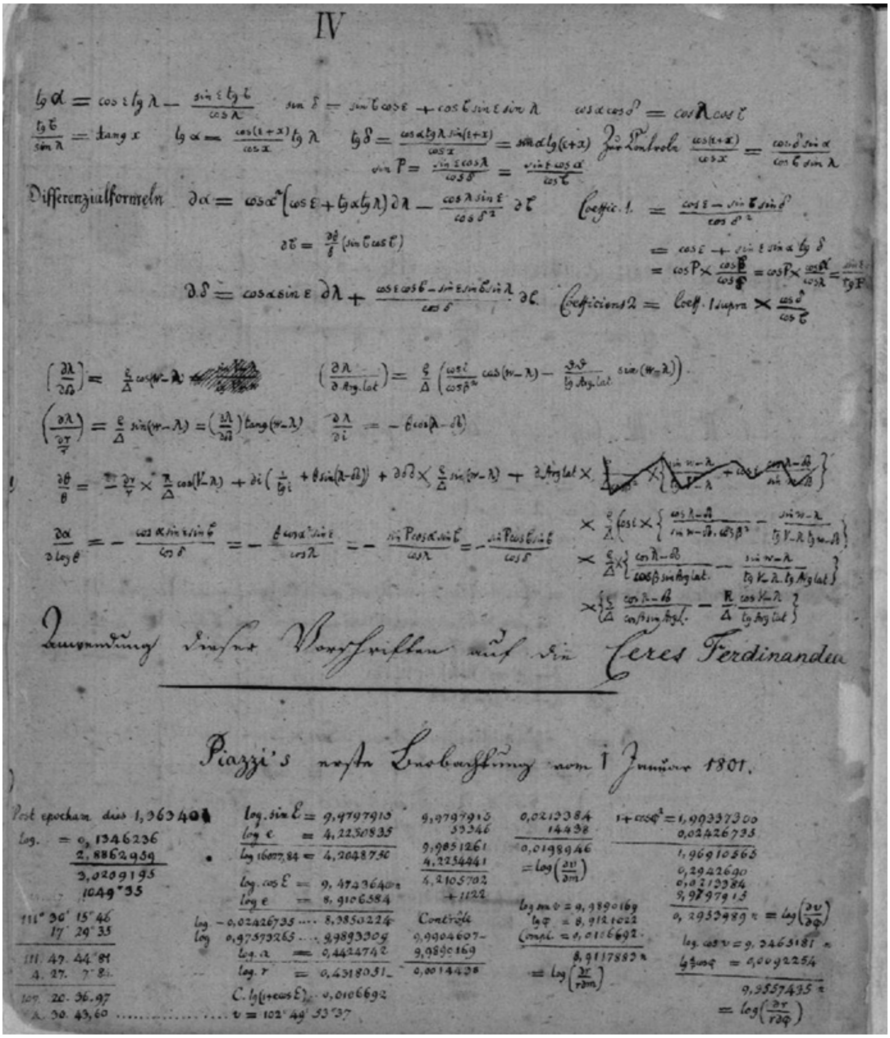


Fig. 6.11 A page from the notebook of Carl Gauss, showing his study of Ceres. (Goettingen University archives)