

The quantities in brackets to the right of the columns of RA. and Decl. respectively are the means formed by omitting stars showing anomalous discordances. These are the quantities used in drawing the interpolating curves, the readings from which are given below:

S. Decl.	Δ RA.	Δ Decl.
25°	0 ^s .000	+0 ^m .10
30	-0.001	0.00
35	+0.001	-0.03
40	+0.020	-0.02
45	+0.011	-0.15
50	0.000	-0.19
55	0.000	-0.13
60	-0.010	-0.10
65	-0.020	0.00
70	-0.031	+0.10
75	-0.050	+0.07
79	-0.061	-0.11

Newcomb — Auwers (in order of RA., corrections depending on Decl. having been applied).

RA.	Δ RA.	Δ Decl.	No. of stars
0 ^h 27 ^m	+0 ^s .062 (+0 ^s .008)	+0 ^m .36 (+0 ^m .21)	7
1 33	-0.051 (-0.014)	-0.06	6
2 31	+0.001 (-0.023)	+0.10	6
3 24	-0.023	+0.33	6
4 21	-0.007	-0.17	6
5 32	+0.034 (+0.019)	-0.40	7
6 32	+0.029	-0.25	9
7 31	+0.092 (+0.027)	-0.16	5
8 22	-0.003 (+0.015)	+0.01	7
9 28	-0.005	-0.20	8
10 37	+0.035 (+0.003)	-0.36 (-0.12)	6
11 39	-0.023	+0.44 (-0.11)	5
12 29	-0.001 (-0.019)	+0.09	11
13 40	-0.004	+0.19	5
14 30	+0.013 (-0.008)	+0.31	9
15 28	+0.019	+0.05	5

London, 1905 June 30.

RA.	Δ RA.	Δ Decl.	No. of stars
16 ^h 32 ^m	-0 ^s .032 (+0 ^s .008)	-0 ^m .13	8
17 26	-0.001	-0.04	11
18 30	+0.002	-0.05	9
19 36	-0.032 (-0.008)	+0.17	5
20 40	+0.003	-0.12 (+0 ^m .06)	7
21 34	-0.024 (-0.009)	+0.15	7
22 30	-0.024	+0.23	8
23 27	+0.018	-0.08	4

The stars omitted in forming the adopted quantities for drawing the interpolating curve in RA. include those of high southern declination. The readings from the curves are:

RA.	Δ RA.	Δ Decl.
0 ^h	+0 ^s .005	+0 ^m .08
1	-0.007	+0.07
2	-0.020	+0.09
3	-0.024	+0.14
4	-0.011	-0.01
5	+0.006	-0.22
6	+0.021	-0.30
7	+0.029	-0.21
8	+0.021	-0.10
9	+0.008	-0.12
10	0.000	-0.14
11	-0.006	-0.11
12	-0.011	0.00
13	-0.008	+0.12
14	-0.002	+0.21
15	+0.007	+0.13
16	+0.008	-0.01
17	+0.005	-0.07
18	0.000	-0.03
19	-0.001	+0.03
20	-0.003	+0.09
21	-0.007	+0.12
22	-0.010	+0.15
23	-0.001	+0.10

A. M. W. Downing.

Positions of (475) Oclo during 1904.

(Harvard College Observatory Circular No. 101).

In Circular 63 (Astr. Nachr. 157.225), a new asteroid was announced which, from its great southern declination, -62°, appeared to be of unusual interest. An orbit was computed, based upon a series of photographs extending from Aug. 5 to Nov. 13, 1901, and this showed that the eccentricity was greater than that of any other asteroid hitherto discovered. In this respect, therefore, it forms a connecting link between the asteroids and periodic comets. Photographs were taken by Prof. Wolf of Heidelberg on Jan. 18, and Febr. 17, 1903, and an object measured which was supposed to be Oclo (Astr. Nachr. 161.291). As this object proves not to be Oclo, an ephemeris for 1905 was

computed under the direction of Prof. Kreutz (Astr. Nachr. 167.349) and Mr. R. H. Frost, in charge of the Arequipa Station of the Harvard Observatory, was requested to photograph the region with the Bruce Telescope. There might be danger that this interesting object would be lost, but fortunately two photographs were taken at Arequipa in 1904, and Oclo marked upon one of them. Measures of Oclo on both of these plates have been made by Mrs. Fleming and the results are given in Table I. On each date, Oclo leaves a trail, and the positions of the two ends of these trails are given in the table.

Table I. Observed positions.

1904	Gr. M. T.	RA. 1855	Decl. 1855
April 4	13 ^h 24 ^m	11 ^h 51 ^m 37 ^s .2	+17° 56'.4
» »	14 54	11 51 35.9	+17 56.7
» 7	13 20	11 49 36.9	+18 4.8
» »	14 20	11 49 35.2	+18 5.0

The asteroid was compared on each plate with nine adjacent Durchmusterung stars. The average deviation of the results derived from the individual stars was about ± 0.8

Harvard College Observatory, 1905 June 27.

in right ascension, and ± 0.3 in declination. A large part of these deviations was due to errors in the Durchmusterung positions. On April 7 a star of about the fifteenth magnitude, RA. = 11^h 49^m 34^s.5, Decl. = +18° 5'.1 (1855), was so nearly in line with the trail of the asteroid that at about 14^h 44^m, Gr. M. T., the asteroid was about one second north of the star. It will be noticed from the Berlin Jahrbuch for 1906, p. 443, that the computed position of Oclo precedes the observed position by about five minutes of time, and is north of it more than two degrees. The daily motion, however, is nearly the same, and there was no other known asteroid in this part of the sky.

Edward C. Pickering.

Zusatz des Herausgebers. Da der Planet (475) Oclo in der Erscheinung 1904 die 15. Größenklasse nicht überstiegen haben kann, ist es an sich wenig wahrscheinlich, daß die vorstehend aufgeführten Planetenspuren ihm angehören. In der Tat zeigt eine von Dr. E. Strömberg aus den beiden Beobachtungen abgeleitete Kreisbahn eine völlige Verschiedenheit der Elemente von denen Oclo's, sodaß die Spuren einem neuen Planeten 1904 QW zugeschrieben werden müssen. Die gefundenen Elemente lauten:

Epoche 1904 April 4.5 M. Z. Berlin.

$$\left. \begin{array}{l} u = 70^{\circ} 11.95 \\ \Omega = 108 54.22 \\ i = 11 14.37 \end{array} \right\} 1855.0 \quad \begin{array}{l} \mu = 716''.53 \\ \log a = 0.46318 \end{array}$$

Nachträglich ist der Planet 1904 QW nahe am Orte der Kreisbahn von Prof. M. Wolf auf einer Platte von 1904 März 20 aufgefunden und von M. und G. Wolf nach der Methode der rechtwinkligen Koordinaten wie folgt vermessen worden:

$$1904 \text{ März } 20 \quad 14^{\text{h}} 20^{\text{m}}.4 \text{ M. Z. Königstuhl } 6 \text{ Zöllner}$$

$$\alpha (1904.0) = 12^{\text{h}} 5^{\text{m}} 12^{\text{s}}.58 \quad \delta (1904.0) = +16^{\circ} 32' 15''.1 \quad \text{tägl. Bew. } -0^{\text{m}}.7 +5' \quad \text{Gr. } 12.0$$

Vergleichsterne: AG. Berlin A. 4624 und 4608 (mit EB.).

Kr.

Positions of (475) Oclo during 1905.

(Harvard College Observatory Circular No. 103).

A letter recently received from Mr. R. H. Frost at Arequipa gives the following account of recent observations of (475) Oclo:

» Since receiving the ephemeris of Oclo we have used most of the dark nights for the search for this object, and at last think we have found Oclo in the following positions:¹⁾

Plate	1905	Exp.	α 1875	δ 1875
A 7335	June 6.7142 Gr. M. T.	90 ^m	15 ^h 43 ^m 24 ^s	-39° 29'.1
A 7337	» 7.6146 »	90	15 42 1	-39 32.3
A 7342	» 9.7088 »	90	15 38 46	-39 40.6

The above measurements and computations were made by Mr. Manson. Oclo, therefore, seems to be about four degrees from its computed position. We should have found the asteroid somewhat sooner, but the use of the „Planet Apparatus“ cuts down the field to such an extent that it requires four times the number of plates to cover the regular field. We had laid out a scheme of nine plates about the ephemeris position as a centre, and the asteroid was found on the eighth plate taken in the series. We shall try to get

two more plates on this object, as soon as the Moon allows, and then two more just before the Moon interferes again, continuing this plan as long as the region may be conveniently reached.*

The observations contained in Circulars 63 (Astr. Nachr. 157.225), 101²⁾, and 103, should serve to determine the elements of the orbit of Oclo with accuracy, and render the loss of this asteroid, at any future time, improbable.

Harvard College Observatory, 1905 July 15.

Edward C. Pickering.

¹⁾ Eine von Dr. E. Strömberg aus den beiden äußeren Beobachtungen berechnete Kreisbahn zeigt, daß die Beobachtungen in der Tat dem Planeten (475) Oclo angehören. Kr

²⁾ Die in Circular 101 enthaltenen Beobachtungen gehören nicht Oclo an; vgl. oben. Kr.