Positions of minor planets and the orbit of one new planet, discovered by H. van Gent

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Citation

BULLETIN OF THE ASTRONOMICAL INSTITUTES OF THE NETHERLANDS.

COMMUNICATION FROM THE OBSERVATORY AT LEIDEN.

Positions of minor planets and the orbit of one new planet, discovered by H. van Gent, by *G. Pels*.

On the plates taken at Johannesburg with the 10-inch Franklin-Adams telescope Dr. VAN GENT has identified the minor planets of which the positions are communicated in this note. The plates have been measured at Leiden in the new Schlesinger measuring machine and the reductions have been performed according to COMRIE's method (*J.B.A.A.* vol. 39, p. 203). The positions are the average of two, measured and reduced independently on plates taken after each other.

The magnitudes have been estimated by Dr. VAN GENT.

Planet	Mag.	Date Gr. C.T.	α_{1900}	δ_{1900}	Comparison stars
		1930	h m s	° ′ ″	
New	12·8	Apr. 21·87060	12 32 55·95	− 9 18 23·9	San Fern. 12h36m, − 9°: 8, 18, 21
		1933			
32	11·0	Oct. 19·94986	2 4 37·55	+ 14 7 11·4	Bordeaux 2h 8m, + 14°: 2, 8, 35
	11·5	Nov. 7·83364	1 48 30·13	12 3 6·0	,, 1h52m, + 12°: 6, 68, 71
43	9·0	Oct. 19·90473	1 17 36·24	14 1 21·8	,, 1h20m, + 14°: 14, 69, 81
58	12·2	Nov. 9·79130	1 48 2·88	4 38 10·4	Toulouse: 1h48m, + 5°: 65, 67, 71
107	11·4	Nov. 9·79130	1 40 57·85	1 48 44·7	Algiers 1h44m, + 2°: 96, 99, 106
126	12·0	Oct. 21·84543	2 55 27·76	18 10 27·4	Paris 2h56m, + 18°: 40, 49, 56
149	12·0	Oct. 21·84543	2 56 47·48	15 14 23·0	Bordeaux 3h 0m, + 15°: 7, 8, 10
179	11·2	Oct. 19·90473	1 19 51·12	18 15 0·1	Paris 1h20m, + 18°: 24, 35, 39
190	12·3	Nov. 9·79130	1 50 7·00	6 0 42·6	Toulouse 1h48m, + 7°: 111, 114, 117
208	12·5	Oct. 19·90473	1 27 50·94	10 12 20·8	Bordeaux 1h24m, + 11°: 215; 1h32m: 61, 64
	13·2	Nov. 9·79130	1 12 17·88	8 48 44·4	Toulouse 1h16m, + 9°: 1, 45, 47
	13·5	,, 14·81735	1 9 30·30	8 33 12·6	Toulouse 1h 8m, + 9°: 53, 55, 58
312	13.0	Oct. 19·90473	1 26 49·38	13 54 39·7	Bordeaux 1h28m, + 14°: 15, 40, 45
320	14·0	Oct. 21·84543	2 29 54·94	16 3 34·8	,, 2h32m, + 16°: 4, 10, 55
388	12·5	Oct. 19·90473	1 28 19·05	14 44 22·0	,, 1h32m, + 15°: 7, 71, 77
	12·5	Nov. 7·83364	1 13 28·34	13 41 35·7	,, 1h16m, + 13°: 21, 38, 47
461	13·4	Oct. 19·94986	2 18 59·66	12 0 45·8	,, 2h16m, + 12°: 80, 219, 223
494	12·8	Oct. 19·94986	2 7 46·02	11 30 41·4	,, 2h 8m, + 12°: 71, 77, 78
541	12·8	Oct. 19·90473	1 41 5·54	18 52 20·4	Paris 1h40m, + 19°: 70, 171, 175
	13·8	Nov. 7·83364	1 26 5·60	16 57 22·4	Bordeaux 1h24m, + 17δ: 44, 99, 111
674	11·0	Nov. 9·79130	1 49 52·10	1 33 42·6	Algier 1h52m, + 2°: 71, 75, 77
755	13·3	,, 9·79130	1 41 9·57	6 52 5·6	Toulouse 1h40m, + 7°: 46, 89, 95
808	13·5	,, 14·81735	0 54 37·76	2 28 32·4	Algier 0h56m, + 2°: 24, 25, 36
912	13·0	Oct. 19·94986	2 14 59·64	+ 12 17 45·3	Bordeaux 2h16m, + 12°: 37, 39, 47

Planet	Mag.	Date Gr. C.T.	α_{1900}	δ_{1900}	Comparison stars
932	11·2	Oct. 19·90473	h m s 1 44 0·66	+ 14 19 47·8	Bordeaux 1h44m, + 14°: 24, 25, 29
	12·5	Nov. 7·83364	1 24 36·38	13 53 10·8	,, 1h28m, + 14°: 1, 34, 40
1102	13·2	Oct. 19·94986	1 55 15·01	15 1 27·3	,, 1h56m, + 15°: 16, 31, 102
	13·2	Nov. 7·83364	1 42 5·11	12 0 8·4	,, 1h44m, + 12°: 16, 71, 80
1114	13·3	Nov. 9·79130	1 13 · 7·09	4 10 54·9	Toulouse 1h16m, + 5°: 59, 62, 69
New	14·0	Oct. 19·94986	2 8 10·38	+ 15 43 12·6	Bordeaux 2h 8m, + 16°: 67, 75, 78

The new minor planet found by Dr. van Gent was also discovered in Simeïs and Uccle; the provisional designations were 1933 SW and 1933 UZ.

The dates and the positions on the Johannesburg plates are:

Date Gr. C.T.	Mag.	α_{1925}	δ_{1925}	Comparison stars
1933 Oct. 19·90473	11·0	h m s 1 21 49·94	11 18 8·8	Bordeaux 1h24m, + 11°: 6, 8, 11
Nov. 14·81735	13·3	1 8 2·61	6 50 10·3	Toulouse 1h 8m, + 7°: 50, 57, 61
,, 19·87260	13·8	1 6 54·50	6 10 46·0	,, 1h 8m, + 7°: 49; + 5°: 4, 7
,, 23·89556	13·5	1 6 27·61	5 43 30·6	,, 1h 8m, + 5°: 1, 5, 6
Dec. 6·82700	14·0	1 7 48·99	4 41 23·8	,, 1h 8m, + 5°: 42, 46, 51
,, 17·82787	14·0	1 12 9·48	4 18 9·1	Algier 1h12m, + 4°: 35, 38, 53

The orbit computations were made by the method Gauss-Encke as modified for the use of calculating machines by Veithen-Merton; using the first, second and last of the above mentioned places. The elements are:

$$g \quad 10\cdot3^m$$
$$M_o \quad 8°\cdot384 \text{ on Nov. } 19\cdot0 \text{ Gr.C.T.}$$
$$\omega \quad 170\cdot845$$
$$\mathrm{☊} \quad 210\cdot106 \left.\right\} \ 1925\cdot0$$
$$i \quad 14\cdot299$$

$$\varphi \quad 8\cdot126°$$
$$\mu \quad 724''\cdot731$$
$$a \quad 2\cdot8833$$

The comparison of the places, computed with this orbit and the observed, is as follows:

Date Gr. C.T.	Place	O–C in α	in δ
1933 Sept. 26·03	Simeïs	— ·29 s	— 5·4 "
Oct. 16·98	,,	+ ·10	+ 4·0
,, 19·90	Johannesburg	·00	·0
,, 19·95	Simeïs	— ·11	+ 5·3
,, 21·00	Uccle	+ ·95	+ 9·7
,, 23·93	,,	+ ·11	+ 1·9
,, 29·02	Simeïs	+ ·20	+ 2·1
Nov. 8·91	Uccle	+ ·05	+ 1·8
,, 14·82	Johannesburg	+ ·01	+ ·2
,, 15·78	Simeïs	+ ·17	+ 3·6
,, 19·85	Uccle	·00	+ 2·0
,, 19·87	Johannesburg	+ ·16	+ 2·4
,, 21·68	Simeïs	+ ·09	— 1·0
,, 23·90	Johannesburg	+ ·08	+ 2·3
Dec. 6·83	,,	+ ·41	— 1·4
,, 17·83	,,	·00	·0

The observations of Uccle are published in B.A.B. 12; the position of Dec. 8,89, there mentioned does not suit in this orbit. Those of Simeïs were kindly put at my disposal by Dr. G. Neujmin.

According to an information by Dr. G. Stracke the planet is probably identical with 392, Wilhelmina, discovered in 1894 and since lost. With an empirical correction in μ of only $-0''\cdot424$ the observations in α of 1894 are satisfied; those in δ leave a difference of 20', probably due to perturbations in latitude.

The ephemeris for the next opposition computed with the elements mentioned above is:

1935	α_{1925}		δ_{1925}	
Jan. 6	h m 9 5·7	m — 5·2	o ' — 4 4	" — 2
14	9 0·5	6·0	4 6	+ 11
22	8 54·5	6·6	3 55	25
30	8 47·9	6·5	3 30	36
Febr. 7	8 41·4	6·1	2 54	46
15	8 35·3	— 5·4	2 8	+ 52
23	8 29·9		— 1 16	

oppos. Jan. 30
mag. 14·3