Value of Micrometer (T.E.P & WHS) Screw = 25.75

Scaled Camera 6" f.l., 26.75 f.l. → F/4.45

1° = 46.7 = 1.186 cm. 1" = 2.141 1 cm = 0.842

5 cm = 26.25 1 mm = 5.25 0.1 = 31.5

End of 1966 — 1967

R.L. Waterfield's Observatory

ASCOT Berks.

1966 Saturn Passage of ring through centre.

Very few observations were made

First record Saturn finish 6th passage through the ring plane (Oct 29) on Oct 16·8 when the ring was of course very easy as fine continuous needle

S. McNeil got an observation on Oct 19·8 (10 days after passage) and definite r. from seeing Ring was easy in 6"

Bad weather prevented further observation until Oct. 29·8 — one 1/2 hour after the passage & no sign of the ring could be seen.

Both J & S McN record the planet several times between Nov 2 and Nov 28 but seeing was never very good & no sign of the ring was ever seen.

The centre reached its maximum elevation above the dark side of the ring on Nov 23 — only 0·26. at the same time the Sun was about 2°·5 above the bright side of the ring. Undoubtedly the failure to see the dark side of the ring was due to this very small angle of 0·26 of the centre's inclination.

The centre again passed through the plane of the ring to its bright side on Dec 18·0 & we hoped to be able to see the ring by the evening of 18th Dec — 3/4 days after. Unfortunately the nights of 18th & 19th Dec were both overcast, and we could not observe the planet until Dec 20 17h 30m. Definite r. from seeing the ring was then very easy as a fine continuous needle.

N.B. I had observed previous passages through the plane of the ring:

1921 at R.O. Greenwich; Phillips, Headley; Hertford; W.H.S. Wolf Norton.

1936. Headley and at Prahra (retiring from China eclipse)

1951 ASCOT.

1967 Occultation (1a)

Jan 21. Z.C. 0621 Mag 6·2 S.D. Moon 11·1^{d} P.A. 128° Pred. U.T $19^{h}\,39^{m}\,12^{s}$ (— —)

NA +0·64 Observed L.S.T $3^{h}\,37^{m}\,0^{s}.75$ (RMW) + cn Clock error $+0^{s}.56$ Slow

Corr " " $3^{h}\,37^{m}\,1^{s}.3$

∴ U.T. of Disappearance was $19^{h}\,37^{m}\,40^{s}.3$ [O-C = $-1^{m}\,31^{s}.7$ (No allowance)]

good quality.

1967 Occultation (2a, 1b)

Feb 21 Z.C. 1169 Mag 5·4 S.D. Moon $12·4^{d}$ PA 96° Pred. U.T $18^{h}\,42^{m}\,35^{s}$

Observed L.S.T. $4^{h}\,43^{m}\,57^{s}.5$ (RMW.) + cn Clock error $+2^{s}.87$ Slow

" " $4^{h}\,43^{m}\,57^{s}.5$ (SMcN) + cn

Corrected L.S.T $4^{h}\,44^{m}\,0^{s}.4$ (RMW)

" " $4\;44\;0.4$ (SMcN)

NA +0·51 ∴ U.T Disappearance $18^{h}\,42^{m}\,35^{s}.2$ (RMW) O-C $+0^{s}.2$

NA +0·51 $18\;42\;35.2$ (SMcN) O-C $+0^{s}.2$

good quality

1967 Occultation (3a, 2b)

Mar 19 Z.C. 0994 Mag 6·5 S.D. Moon 8·8 P.A. 121° Pred U.T. $23^{h}\,52^{m}\,25^{s}$

Observed L.S.T $11^{h}\,37^{m}\,5^{s}.25$ + cn (RMW) $11^{h}\,37^{m}\,6^{s}.25$ + cn SMcN Clock +5.39 Slow

Corrected L.S.T $11^{h}\,37^{m}\,10^{s}.64$ (RMW) $11^{h}\,37^{m}\,11^{s}.64$ (SMcN)

NA −0·59 ∴ UT Disappearance was $23^{h}\,52^{m}\,24^{s}.2$ (RMW) (O-C $-0^{s}.8$)

NA −1·12 $23^{h}\,52^{m}\,26^{s}.2$ (SMcN) (O-C $+0^{s}.2$)

good quality

1967

March 5.8 (night of Sun–Mon 5–6th) OaO plate 6" Triplet.

T = 49°–47° F3-11 Transp 7/10

Comet Wild — 1967c. new comet discovered in Bern Feb. 11. | but scattered local sky lights

(1967c) Poor weather prevented observation before to-night. The comet had been in v. high declination (+81° at discovery) and is moving very rapidly Southwards.

Ilford an exposure driving on a moving web in PA 90° ? at a rate of 40".25 in 10 minutes. S. McNeill guided the telescope in 1¼ minute steps (5" each) and exposed for 21 minutes 15 secs.

L.S.T. $6^h 35^m 1^s \longrightarrow 6^h 56^m 16^s$ + corr Clock corr = $-0^s.4$ Fast

Corrected Mid L.S.T. = $6^h 45^m 38^s.1$ Plate centred at $5^h 8^m.5$ $+29° 6'.0$

A quick visual search with 6" showed no sign of comet.

The plate showed a strong image of the comet. The coma moderately condensed is about 45" in diameter and there is a broad straight tail 3' long directed towards PA 70° Nf — more or less away from Sun. Integrated photographic magnitude estimated at 10.0. Because of scarcity of guide stars comet is about 1° off plate centre.

Plate measurement C Wild 1967c

Twelve stars were measured + 4 independent reductions made — their mean giving the adopted position :-

Mar 5.831043 $\alpha = 5^h 7^m 22^s.67$ $\delta = +28° 55' 35''.2$ (1950.0)

(UT = $19^h 56^m 42^s.1$ L.S.T. = $6^h 45^m 38^s.1$)

Range $\alpha = 0^s.11$ $\delta = 2''.3$.

1967. Occultation (4a)

Mar 20 ZC 1131 Mag 7.2 D.D. Moon $9^d.8$ P.A 110° Pred. U.T. = $23^h 30^m 49^s$

Observed by R.A.W 6" (S.McNeill with 4" Lohtstar before Dis. thru 'window vibration')

Observed L.S.T. $11^h 19^m 22^s.5$ + cor Clock error $+5^s.95$ Slow.

Corrected " " $11^h 19^m 28^s.5$

NA < 1".77 ∴ U.T. of Disappearance was $23^h 30^m 49^s.0$ (O-C = 0.0)

No correction — probably very small good quality

1967 Occultation 5 (3b)

Mar 22 Z.C. 1393 Mag 6.7 D.D. Moon $11^d.7$ P.A. 163° Pred. U.T. $22^h 20^m 45^s$

Observed by S.McNeill 6" only; (RAW in London)

Observed L.S.T $10^h 16^m 57^s.5$ + cor Clock error $+6^s.4$ Slow

Corrected " " $10^h 17^m 3^s.9$

∴ UT Disappearance was $22^h 20^m 42^s.8$ quality fair — doubt of clock error

NA −0".83 [O−C = $-2^s.2$] of a few tenths second

1967 Occultation 6 (5a, 4b)

Mar 23 Z.C. 1514 Mag 6.1 D.D. Moon $12^d.7$ P.A. 70° Pred. U.T. = $21^h 24^m 55^s$

NA +0".68 Observed L.S.T $9^h 24^m 57^s.8$ + cor (RAW) Clock error +6.16 Slow

NA +0".38 9 24 58.75 + cor (SMcN)

Cor. " " $9^h 25^m 3^s.96$ (RAW) and $9^h 25^m 4^s.91$ (SMcN)

∴ U.T. Disappearance was $21^h 24^m 55^s.5$ (RAW) good quality.

21 24 56.4 (SMcN.)

[O−C $+^s.5$ RAW
O−C +1.4 SMcN]

1967

March 27.8 (night of Mon-Tues 27^{d}.28^{d}) Oc-O plate 6" Twilight

Comet Wild 1967c Transp. 5/10 SE Twilight

Exposure 20 minutes L.S.T 8^{h} 7^{m} 1^{s} → 8^{h} 27^{m} 1^{s} + 20

Mid L.S.T. of Exposure = 8^{h} 17^{m} 4.^{s}0 Clock +3.^{s}0 Slow

guided by S. Mc. Neil who drove on a moving scale in PA 12° at rate of 31.″2 in 20 minutes with ¼ or 5 minute steps of 7.″8.

Plate centred at $\alpha = 5^{h}\,15^{m}.0$ $\delta = +6°\,29'$ approx.

The plate shows that the comet has very gently faded since Mar 5.7

Photographic mag. est. at 12.0. The coma is about 25" in diameter essentially circular with no sign of any tail.

Plate measurement C. Wild 1967c

March 27.8 Nine stars were measured & 3 independent reductions made; the means of these three gave the adopted position:-

March 27.834295 $\alpha = 5^{h}\,14^{m}\,1^{s}.14$ $\delta = +6°\,24'\,12.″2$ (1950.0)

UT = 20^{h} 1^{m} 23.1

GST = 8^{h} 17^{m} 4.^{s}0 Range $\alpha = .^{s}07$ $\delta = 2.″2$

Mar 31.8 C. Wild (1967c) (night of Fri-Sat 31-1st) Oc-O plate 6° Twilight Transp 4.

The transparency was only moderately good - not so good as Mar 27.8. We gave an exposure of 25 min. Corrected time of mid Exposure was L.S.T 8^{h} 57^{m} 32.^{s}3. Drove on moving scale in 5 minute steps of 7.″4 each. Plate Centre 5^{h} 17^{m} +4° 30' (S. McN. drove)

Careful search showed no sign of comet which is estimated less than 13.0 mag

1967 Occultation 7 (5h)

April 17 2.C.1088 Mag 5·6 DD Moon 7ᵈ·0 PA 34° Pred. U.T 0ʰ 12ᵐ 47ˢ

Observed by S. McNeill 6" (only) (Time signals RNW)

Observed LST 13ʰ 48ᵐ 16ˢ·5 + corr (SMcN) Clock error −10ˢ·3 Fast.

Corrected to 13ʰ 48ᵐ 6ˢ·2 L.S.T.

NA −0"·01 ∴ U.T. Disappearance was 0ʰ 12ᵐ 52ˢ·9 (O-C + 5ˢ·9)

good quality

1967 Occultation 8 (6h)

April 17 2.C.1089 Mag. 6·8 DD Moon 7ᵈ·0 P.A. 151° Pred. U.T 0ʰ 18ᵐ 39ˢ

Observed by S. McNeill (Time Signals RNW)

Observed L.S.T. 13ʰ 54ᵐ 4ˢ·8 + corr (SMcN) Clock error −10ˢ·3 Fast

Corrected to 13ʰ 53ᵐ 54ˢ·5 LST

NA −0"·71 ∴ U.T. Disappearance was 0ʰ 18ᵐ 40ˢ·2 (O-C = +1ˢ·2)

1967.

June 6·0 Periodic Comet Tempel (2)

This was the first attempt I made to photograph this comet

June 6·0 (night of Mon.-Tuesday 7 June 5-6) 0a-0 Plate

Exposure 30 min. Transp 4-5/10 Temp = 61°-61° Power 7.

LST 16h 45m 2·0 → 17h 15m 2s·0 + corr (clock 2s·02 fast)

Corrected LST mid Exposure = 17hr 0m 0s·0

The telescope was driven with a fixed web. The comet was moving slowly: 10-minute motion $\alpha = +2''.5$ $\delta = -1''.4$ (i.e. ± 3" in PA ↙)

There was no sign of the comet visually in 6"; on the plate it was a faint object, but when found was well condensed & suitable for measurement. The estimated photographic magnitude was 12·5

Measurement 9 stars were measured on plate & 3 independent reductions made. The straight mean was taken: 7 June 6·005320 18h 25m 28s·31 −2° 55′ 7″·8 (1950·0)

June 13·0 (night of 7 June 12-13, Monday-Tuesday) P. Tempel (2) 0a-0 plate

Exposure 25 min. Transparency 5/10 T = 51°-49° Power 10.

LST 16h 50m 1s·0 → 17h 15m 1s + corr (Clock 3s·2 slow)

Gr. LST mid Exp. 17h 2m 34s·2 I.D. U.T 23h 42m 42s·1 7 June 12.

Driven on fixed web. Comet slow moving.

Good image of comet on plate. Photographic magnitude estimated 12·0

Measurement 12 stars were measured & 4 independent reductions made. The straight mean was taken: 7 June 12·987987 18h 27m 23s·01 −3° 39′ 1″·9 (1950·0)

1967.

1967 Occult. 9. (6a)

June 16. ZC. 1855 Mag 7·1 Mon 8·7 days D.D. P.A. 101°.

Observed by RIW. Observed UT $15^h\ 27^m\ 49^s.5$ +cor Clock error $0^s.80$ fast

Corrected Observed D. UT = $15^h\ 27^m\ 48^s.70$

∴ U.T. Disappearance was $21^h\ 52^m\ 28^s.5$ (good quality)

O-C = $-0^s.9$

1967 Occult. 10 (7a)

June 18 ZC. 2104 Mag. 7·5 D.D. Mon 10·7 d. P.A. 92°

Observed by RIW Observed UT $17^h\ 6^m\ 7^s.9$ +cor (Clock 1.83 fast)

∴ Corrected UT = $17^h\ 6^m\ 6^s.07$

∴ U.T. Disappearance was $23^h\ 22^m\ 37^s.9$ (good quality.)

O-C = $-4^s.7$

1967. Occult. 11 (7b) Michael Hendrie staying. Observed by him in 6" as Eddie too high for me to move comfortably

Aug. 26 Z.C. 0457.

Mag 6·5 Reap. DL. Mon 20·9 dy. P.A. 295°.

I had previously calculated the distance of the dark limb, when stars were to reappear, radially from the terminator – this was 6'.6 or 26·2 Revs. of micrometer screw. The distance wobs were separated by this amount. One of these wobs (a) was placed tangentially to the bright limb at PA. 115°. Then by moving the telescope parallel to the position wobs, until wob (a) was on the terminator the point of disappearance was indicated by the intersection of wob (a) & position wob. The star reappeared within a few seconds of arc of this point & M.J.H. got a good observation.

Observed M.J.H UT $8^m\ 14^s.46$ (S.I.) Before U.T $23^h\ 35^m.000$ [? light & wrist clock which was found to have stopped]

i.e. Reappearance occurred at $23^h\ 26^m\ 46^s.9$ UT good quality. O-C = $+3^s.4$

1967

7mm 30·0 P. Temple (2) (night of 7mm 29-30, Thurs.-Fri.) Oa-O Plate

Exposure 20 mins Transp. 6/10 Temp 57°-55° Focus 8

G.S.T. $17^h 46^m 8^s$ → $18^h 6^m 8^s$ + corr. (Clock $6^s·0$ fast)

Mid Exposure corrected GST $17^h 56^m 2^s·0$ i.e. U.T. = $23^h 29^m 10^s·6$

Telescope driven with fixed worm

The comet was fairly easy object in 6" and its visual magnitude estimated at 11·5. There was a strong image on plate a magnitude estimated at 11·5 photographic.

Measurement of Plate. Nine stars were measured, but it was found that one of them BD -8°4638 gave a poor position. This was discarded; and the result taken from 3 reductions comprising 8 stars - each of 8 stars being given equal weight.

7mm 29·978595 $18^h 29^m 20^s·31$ $-7° 43' 55''·1$ (1950·0)

7July 9·0 P Temple (2) (night of 7July 8-9, Sat.-Sun.) Oa-O Plate

Exposure 20 mins. Transp 6·7/10 Temp 58°-56° F = 8.

LST $18^h 10^m 2^s·0$ - $18^h 30^m 2^s·0$ + corr. (Clock $3^s·0$ slow)

Corr GST mid-Exposure GST $18^h 20^m 5^{sec}$ U.T. $23^h 17^m 46^s·5$.

Telescope driven with fixed worm. Comet fairly easy in 6" Vis Mag 10·5-11·0 Good image on plate - no tail etc. - Phot. mag est. 10·8

Measure of Plate. Nine stars measured only 8 stars used in 3 reductions - each of 8 stars given equal weight.

7July 8·970 677 $18^h 30^m 12^s·34$ $-11° 22' 15''·5$ (1950·0)

1967 occult. 12 (8a)

Nov. 9. ZC. 3227 Mag 6.4 Moon 7.6 days. S.D. PA. 105°.

Observed by RHW. ✓S.T Diff. = $23^h\ 36^m\ 1^s.5$ + corr (Clock 2.25 slow)

Corrected GST Dis. = $23^h\ 36^m\ 3^s.75$

∴ U.T. Disappearance was $20^h\ 25^m\ 20^s.7$ good quality.

O-C. = $-4^s.8$

With a Closing & Dismantling of the Observatory at Ascot.

The above occultation (Nov. 9) was essentially the last observation made at Silwood Park, Ascot. There were at the time no comets for observation; and what with my impending move from Ascot to Somerset-Dorset region there was little opportunity for doing any Stars astronomical work.

During the summer many possible houses were seen in Somerset & Dorset with a view to finding one remote from artificial lighting & with a reasonably good horizon.

Finally I decided on a modern bungalow with about ½ acre of garden on the edge of the hamlet of Woolston near North Cadbury in Somerset. This was remote from lights as it being surrounded by agricultural land seemed likely to remain so for a long time. And the horizon was reasonably good. The sale was purchased & alterations were started on the bungalow in October.

The observatory at Ascot began to be dismantled & packed on Dec. 5. RM Fry, T.B. Seddon & Ian Purcell gave great help. The Roofing Boy was removed & everything packed by Mr. Parkin & his assistants of the I.C.S.T agricultural research Station lorry & moved to Woolston in 2 journeys on Dec. 14th & Dec. 19.

1967.

July 17·0 P Temple (12) [night of July 16-17, Sunday-Monday] 0a-0 phot

10 min Exposure Transp. 6-7/10 Temp 63° F5.

LST 19h 11m 5s·0 → 19h 21m 5s·0 (+ cor) (Clock 6s·2 slow)

Mid Exposure Corrected LST 19h 16m 11s·2 = UT 23h 42m 16s·2

Telescope driven on fixed wch. Comet was fairly easy object on phot but seemed to be of same magnitude as on July 9. Phot. Mag = 10·8

Not seen in 6" – low altitude & difficult horizon for observing ladder.

Measurement. 10 stars were measured – but only 9 used in reductions

We gave each of nine stars equal weight –

July 16·987 687 18h 32m 13s·15 −15° 21′ 48″·7 (1950·0)

July 27·0 P Temple (12) (night of July 26-27, Wednesday-Thursday) 0a-0 phot

Exposure 10 mins Transp. 4/10 v. low alt. Temp 65°-63° Focus 6

LST 18h 16m 5s·0 → 18h 26m 5s·0 + cor (Clock 2s·9 fast).

Mid Exposure Corrected LST 18h 21m 2s·1 = U.T. 22h 7m 57s·0

Telescope driven on fixed wch. Extremely low altitude – telescope & camera only just clear of walls. Unable to look for comet visually.

In spite of v. low altitude + poor transparency image of comet was, though faint, surprisingly confined for good measurement. Est. Phot. mag 10·5

Measurement Eleven stars were measured & in the 8 reductions made each star received an equal total weight

July 26·922188 18h 37m 52s·83 −20° 52′ 42″·8 (1950·0).

1968 Jan-Feb. Mar Interim build after move Ascot to Worlston

The Observatory, Worlston, near North Cadbury, Somerset.

The household furniture, including the library and various smaller instruments, were moved in furniture vans from Ascot on December 22, 1967. The observatory & the larger equipment was moved down separately on Dec 14th & 19th in the lorry of the Agricultural Research Station of the Imperial College of Science & Technology. The College very generously supplied the lorry & driver & borrowed the labour for packing all the equipment onto the lorry. On arrival at Worlston all the instruments were stored in the bungalow garage, with the exception of the observatory roof & wireless mast which were parked & covered on the front lawn.

Ingrey & Ian Parcell moved into the Bungalow on Dec. 30 and during January & February 1968 the builders (David Chant) completed the slight alterations made to the bungalow. Early in February David Chant started laying the foundations of the observatory & making the concrete footings to build from the bungalow.

The base of the observatory was a concrete raft about 8" deep & about 20 foot x 20 foot with a central piers about 2 foot deep & another on one side — the first for the telescope, the second for the sidereal clock. The walls of the building were made of concrete blocks (as opposed to the original wooden ones); & the internal measurements of the building were increased by about 18" to x feet. The walls were lined on the inside with insulating boards & an air sheath; & a wooden floor was placed over the concrete base. The building was surrounded by

1968 7th Feb. Mon. Interim period ASCOT & WOKINGHAM

a concrete hatchway about 3 feet wide, ring the perimeter of the concrete raft, with a low wall of concrete about 2 feet high.

As the dimensions of the building had been increased by about 18" each way the lower part of the roof, supporting the circular steel rail for the upper revolving part, had to be enlarged to fit onto the larger building beneath. This was all carried out successfully by Harold Chard & his men. [The lower part of the roof with the circular rail had to be divided into 2 halves for the road journey; but when it was reassembled the circularity of the rail had not been disturbed.] The building was decorated with one window due South, and a sliding door on the West side. Electric light & power was laid on from the bungalow.

The building was practically completed by the evening of Friday Feb. 23rd. and that same night the lower section of the pillar was set in place. On the morning of the 24th we started erecting the rest of the telescope. Soon after midday RM Fry arrived unexpectedly & gave most valuable help in the assembling of the polar & declination axes, clamps, circles & slow motions. The assembly was essentially complete but some wiring. Doing this work and managed to get the orientation of the polar axis sufficiently accurate; and on the night of February 27 & 28 I exposed my first plate on Comet Ikeya-Seki.

A lot remained still to be done. So far the orientation of the polar axis had only been done roughly with the circles visually. The accurate adjustment photographically was

Position and altitude of declination axis of 6" equatorial

at WORLSTON, SOMERSET.

$\lambda = +2^\circ\ 30'\ 16''.0$ West $\quad \phi = +51^\circ\ 2'\ 47''.5$ Height 97 metres.

(10 minutes 1·3 seconds)

[Difference from Greenwich $d\lambda = +2^\circ.525$; $d\phi = -0^\circ.434$]

1968 Jan - Mar Interim Period Assist to Woolston.

undertaken gradually mainly during moonlight as the comet occupied occupied all the time during the dark of the moon. The wireless mast carrying the 100 foot bi-filar aerial required some repair & the leading in had to be replaced (after 20 years at Arthur). This was completed by Mar 18th, which signals were obtained regularly from M.S.F. (using the Vernier method of coincidences with the Sidereal clock). We also had some trouble with the Sidereal clock; however after cleaning carefully it began to perform well. From Feb 4th to Mar 18 we had to rely on the Chronometer (on loan from Admiralty via Dick Woolley) This was of highest quality & during January & February I had started rating it; and the time taken from it could be related to G.M.T. less than 0.1 sec. From Mar 18 we used the sidereal clock which could be related to G.M.T. 0.01 sec.

The 6" Transit with Camera had been moved intact and I was glad to find that the piers had undergone no change.

The determination of the position of the new site was made from the 6" & 15" O.S. maps of the region. Owing to my unsuitability it was difficult for me to determine the position of the telescope in relation to the landmarks on the maps. We used a rough approximation at first; but W H Stevenson came to stay from April 20-29 & was able to determine the precise location on the map & also with his accurate Aneroid to find the altitude of the declination axis above the 300 foot contour at the bottom of our drive. The pier was finally adopted were :—

See Sketch Page.

C. Honda Ikeya-Seki 1967 n

1968 Feb 27-28 (night of Tuesday-Wednesday).

This was the first clear night after the preliminary adjustment of the orientation of the finder axis, and was the first opportunity to photograph the new comet Honda Ikeya-Seki discovered at end of December.

Feb. 28.1. Exposure 10 mins. Ozaco Plate Transp 6-7/10, T=33° F.15.

L.S.T. Exp $10^h\ 58^m\ 5^s \rightarrow 11^h\ 8^m\ 5^s$ + Gr. * Clock was wrongly corrected.

Gr Mid LST. $11^h\ 3^m\ 25.^s7$ *Clock $20^s.7$ Slow.

Stars with moving web. P.A. 37° ↑ 34".5 in 10 min in 1/4 = 8".3 steps.

Visual Comet was easy in 2" finder. Visual mag est. 7.0

Photographic Coma Outer Diameter 25' Inner condensation 1.0' Diameter.

Tail Main part - Gradually tapering spine 7'.5 long in PA 280°

Wide fan 210°-290°, ranging up to 3' Dep Integ Mag ± 7.0

Plate centre + $17^h\ 05^m$ + 40° 42'

1968 Mar 4.0 (Mar 3-4 night of Sunday Monday)

C Ikeya Seki 1967 n Exposure 30 mins. Transp 5-6/10 T=34° F 14.5

L.S.T. $12^h\ 12^m\ 30^s$ — $12^h 42^m\ 30^s$ + Gr. (clock $16^s.6$ slow). Mid Gr. LST $12^h\ 27^m\ 46^s.5$

Stars with moving web in P.A. = 90° ↑N 20 min M = 73".4 : in 2½ min = 1/8" = 9".17 steps.

Plate centre $\alpha = 17^h\ 17^m$ $\delta = +47°\ 46'$

Photographic image. Nuclear Coma 10' in Diameter of Cent. Central Condensation ± 3' diam.

Main Tail: Straight rather diffuse spine extending 22' from centre of Coma in P.A. 275°.

The two "lobes" of a diverging envelope issue from N & S fronts of coma towards P.A. 300° & 210° & are very diffuse & wide extending about 7' from centre of coma.

The axis of the lobes envelope is not symmetrical with the tail lying in P.A. 250° ±

Integrated Mag ± 7.0

1968. Mar 27-28 and March 31

Checks on

Adjustment of Polar Axis. When the telescope was first mounted at Webster on Feb. 24 the adjustment orientation of the polar axis was done by means of declination circle readings. This was sufficiently good for the observation of comets in all but very high declinations.

On March 27 a Polaris was exposed on the Pole and 2 short exposures made with an interval of 60 minutes showed that the error in orientation was 153".5 - about 116" in azimuth + 101" in altitude. This was corrected during daylight on afternoon of March 31.

1968

Mar 12·0 (night of Mar 11-12, Monday-Tuesday)

C/1969 i Schi 1969n Exposure 4 min. 3 days before Full Moon Transp 6/10. Moon left sky.

LST $10^h 58^m 1^s \rightarrow 11^h 2^m 1^s$ +cor Clock 20·5 sec Below

Corrected mid LST = $11^h 0^m 21^s.5$ Error with Fixed web

Visual Comet easy in 6" despite moonlight Est. mag ± 7·0

Photographic Central nucleus almost stellar but elongated N-S by motion (± 15")

Central Condensed part 1' diameter. Overall diameter 2½'.

This short exposure (necessitated by near Full-moon) was taken for Position measurement.

Plate centre $17^h 17^m$, + 54° 56' approx.

N.B. Though considerably fogged it could have had even longer exposure (4 → 6 min) without gross fog.. This was v. surprising (after cirrus) with such a bright moon.

Mar 26·0 (night of Mar 25-26, Monday-Tuesday)

C/1969 i Schi 1969n. Exposure 32·5 min Transp 7/10. T = 45°. F = 12.

LST $9^h 25^m 1^s \rightarrow 9^h 57^m 32^s$ +cor (Clock $2^s.5$ Slow).

Corrected Mid LST = $9^h 41^m 19^s.0$ Error with moving web in PA 73°37'

20 min Motion = 2·68 Revs = 64".0 in $\frac{1}{8}^h$ = 2·5 mins = 8".6 Sths.

Plate Centre $16^h 39^m$ + 80° 41' (1968·3)

Photo. Good plate Coma diameter (through centre of comet ⊥ to axis of tail) Extent overall 5'-7'.

" " Condensed part 2'.

Tail. Main part is a diffuse central shaft 27' long in PA. 225°

Two "wisps" of a conical envelope project either side of main symmetrical with axis of tail.

Est mag. about 7·0.

Mar 27 North Polar Region

Orientation Faxin.

April 3-4. Photographs were exposed on the Pole — 2 short exposures given with 60 minutes intervening. The overlap of the 2 images appeared complete but owing to very poor seeing the images were not critical; and the test should be repeated at some future time. However the adjustment is accurate enough for practical purposes.

1968

April 2.8 (night of April 2-3, Tuesday Wednesday)

C. Ikeya-Seki 67n Exposure obtained during a short gap in Cloudy Sky.

Exposure 3 minutes Ox-O plate. Still considerable twilight & high 5-day moon.

Drove on fixed worm — drive not corrected during exposure.

LST $8^h\ 38^m\ 31^s \rightarrow 8^h\ 41^m\ 31^s$ + ω Clock 0.9 fast.

Corrected Mid LST = $8^h\ 40^m\ 0.1^s$.

Plate exposed imminently for position.

Photographic Coma overall diameter ± 90"

Central condensed part 30" diameter.

Two radial spikes: the strongest in PA 135° ± 45" long.

Second most weaker in PA 30° ± 60" long

Plate centre $\alpha = 10^h\ 21^m$ $\delta = +87°\ 0'$.

April 4.9 (night of April 4-5, Thursday Friday)

[Its actual was made to expose on C Ikeya-Seki during short gaps in cloud. In the hurry to take advantage of this gaps the telescope was accidentally set on the wrong side of the pole - so the cursor not clamped until plate was developed!]

2 minute Exposure. Free drive. Mid cor. LST = $10^h\ 31^m\ 1^s.4$ Plate Centre $20^h\ 29^m + 85°\ 30'$.

1968 (1)

Occultⁿ 1968. April 6. Z.C. 1211 Mag 6·2 Disappearance D.L. P.A. 111°

Observed L.S.T of Disappearance $12^h\ 55\ 20^s\!\cdot\!0$ + corr (clock $1^s\!\cdot\!6$ slow)

∴ Corr. L.S.T. of Dis. was $12^h\ 55^m\ 21^s\!\cdot\!6$

or U.T. $24^{hrs}\ 4^m\ 3\cdot4$ sec. (April 7 $0^h\ 4^m\ 3^s\!\cdot\!4$)

The quality of observation was fairly good.

This was the 1st occultation observed at Wootton. We intended to observe one immediately before viz 1206 Z.C. – but stupidly made an error in the longitude correction & missed it – but just had time to put it aright for the second one, ZC 1211.

Preliminary reduction from N.A Office gives $-0''\!\cdot\!15$ for correction of this observation for distance from corrected limb.

O-C from Hamburg $-4^s\!\cdot\!6$

April 5·9 (night of April 5-6, Friday - Saturday) very transp 7/10 - but mostly at 1st quarter

C Ikeya-Seki 1967n Exposure 3 mins Oa-O Wratten

LST $9^h 40^m 30^s.0 \rightarrow 9^h 43^m 30^s.0$ + wr (clock 10^s slow)

∴ Corr Mid LST = $9^h 42^m 1^s$

Trees with fixed web. Plate Centre $\alpha = 7^h 39$ $\delta = +83° 38'$

Photographic: unfortunately the trees is not perfect: definite wriliness of stars images.

Coma Overall diameter = 2'.5. Central Condensation 20" diameter.

Two radial spikes: 60" long in P.A. 135° & 110°: neither are quite, tho' very nearly, radial.

April 6·8 (night of April 6-7, Saturday Sunday)

C Ikeya-Seki 1967n Exposure 2 mins. Plate Oa-O. Very Transp 7/10. Bel half moon high

LST $9^h 48^m 1^s$ — $9^h 50^m 1^s$ + wr. (Clock 1.6 sec slow)

∴ Corrected Mid LST = $9^h 49^m 2^s.6$

Trees with fixed web. Plate centre $\alpha = 7^h 42^m$ $\delta = +83° 38'$

Pattern short exposure & weaker image Coma about 2'.0 diameter & Central Cond about 20" No detail. Circular

April 11·9 (night of Apr 11-12, Thursday Friday)

C Ikeya-Seki 1967n Exposure 2 mins. Plate Oa-O Transp 5/10 - 1 day before Full Moon.

LST $11^h 30^m 1^{sec}$ — $11^h 32^m 11^{sec}$. + wr. (Clock 2·9 sec slow)

Corrected Mid LST $11^h 31^m 8^{sec}.9$

Trees fixed web Plate centre $\alpha = 7^h 3^m$ $\delta = +78° 56'$

Pattern weak image of comet. Essentially same April 6·9 — Circular.

1968

April 13·9 (night of 13-14^h; Saturday Sunday)

C/Ikeya Seki. Exposure 2 mins Plate Oa-O Full Moon Transp 4/10. T=42°
1967 n. LST $10^h 56^m 31^s \rightarrow 10^h 58^m 31^s$ + corr. Clock 3.6 sec slow.

Corrected mid LST $10^h 57^m 34^s.6$

Drive on fixed web. Plate centre $6^h 54^m$ $+77° 5'$

Centre Poor Plate, Star images rather woolly. Comet image weak – near bright star.

April 14·9 (night of 14^h–15^h, Sunday/Monday) P

C/Ikeya-Seki Exposure 17½ min. Oa-O Plate. Transp. Fair but moon full rising.
1967 n. LST $10^h 57^m 30^s - 11^h 15^m 0^s$ + corr. (Clock 3.9 sec slow)

Corrected mid LST $11^h 6^m 18^s.9$

Drive with moving web in 2½ minute, 5.5 cms in PA 78°.5

The focus is poor & the star images v. woolly. First plate of New Batch with green fog band running diagonally across Plate (all plates in box affected – returned to Kodak!) Fortunately comet is just clear of fog band.

Comet image strong. Central condensation 1' diameter. Outer coma 3'.5 diameter with diffuse fan tail PA 30° – 110° with stronger condensations in PA 90° and 45° – the strongest in 45° PA is about 8' long. Plate centred near $6^h 53^m.0$ $+76° 15'$

April 26·0 (night of 25^h–26^h, Thursday–Friday)

C/Ikeya-Seki Exposure $45^m 5^s$ Plate Oa-O Transp 7/10 T 55-50° F=8·5
1967 n. LST $11^h 58^m 1^s - 12^h 43^m 6^s$ + corr (clock 1.1 Fast) Cor Mid LST = $12^h 20^m 32^s.4$

Drive moving web in ¼ = 2½ minute = 4".7 steps in PA 90°

Plate centred near $6^h 45^m$ $+68° 0'$

Continued over →

Occult (2) 1968.

May 2 Z.C. 1035. May 68 Straßheim Dark limb P.A. 71°.

Observed CST of Tri $12^h\ 14^m\ 3^s.0$ + est. Clock $3^s.0$ chr

Corrected CST $12^h\ 14^m\ 6^s.0$

U.T. of Observed Tri is $21^h\ 40^m\ 40^s.9$

Quality of Observation very good.

Preliminary reduction from N.A Office gives distance of Star from Sun's Centre as $+0''.35$ from corrected limb. O-C. from Standard is $+1^s.9$.

1968

April 26·0 continued C/Ikeya Seki 45 min. exposure.

Pretty good plate: tail good, tricks worn, driving reasonably good.
Tail in a faint diffuse broad fan, as before, PA 110° – 45°. Main extension is around PA 60° to a distance of about 12'. Outer coma has a diameter of ± 4' and the central condensation about 1' diameter – this is eccentrically placed, the coma extending more in the direction of the tail.

May 4·1 (night of May 3–4, Friday–Sat.) Transp 3/4/10

C. Tago-Honda-Yamamoto 1968a was discovered in Japan on April 30·8

I made a 5 minute exposure through high thin hazy cloud – the 1st chance I had got – with plate centred $\alpha = 0^h 13^m$ $\delta = +35° 15'$. But there was no sign of the reported 7·0 mag. comet.

Exp. 5 min GST $16^h 50^m 1^s.5 \rightarrow 16^h 55^m 8^s.5$ (about U.T. $2^h 15^m$.)

May 6·0 (night of May 5–6, Sunday–Monday)

1/ C/T-H-Y 1968a. Much hazy cloud

Another attempt – an Exposure of 1½ minutes – was made during a gap in the clouds. GST 15 20 10 – 15 21 38 centred on $\alpha = 0^h 57^m.6$ $\delta = +4\ 49° 20'$. Again no sign of comet on plate. Daily Motion given in
It was later found that there was an error in the Ephemeris/Card
Declination quoted from RAS – so the comet was not shown on the above 2 plates.

2. C/Ikeya-Seki A 4 minute exposure was given GST $13^h 31^m 30^s - 13^h 35^m 30^s$ + ca $2^s.5$ slow
that centred GST = $13^h 31^m 32^s.5$. Plate centred around $6^h 45^m + 62° 15'$
Stars fixed reb. Good star image for moment. Central bad 1' diam. Overall coma 3' diam. Round
May about 8·0 No tail.

1968.

May 11-12 (night of Saturday-Sunday)

C/Tago-Honda-Yamamoto 1968a Oa-O Plates Tmuch good. Full moon

Two short exposures were made to make another attempt to locate the comet. An exposure of 4 minutes was made about 2 hours before midnight, & one of 7 minutes (the extreme limit for full-moon) about 2 hours after midnight.

(1) Expose 4 min LST 12 56 31 - $13^h\ 0^m\ 31^s$ + co (clock 1.6 slow)

Corrected mid LST $12^h\ 58^m\ 32^s.6$ (approx U.T. $21^h\ 49^m$)

(2) Exposure 7 min LST $16^h\ 55^m\ 31^s$ - $17^h\ 2^m\ 31^s$ + co (1.6 slow)

Corrected mid LST $16^h\ 59^m\ 2^s.6$ U.T. = $16^h\ 49^m\ 26^s.1$

(1) The first plate was moderately fogged; and at first sight no sign of comet could be found, but as soon as the much stronger image was found in the longer, second exposure, the image on the first exposure was soon detected.

(2) The second plate was very heavily fogged; but the nucleus of the comet is quite obvious:

It is a large circular haze fading out to the bright but showing extraordinarily slight condensation towards the centre. The overall diameter on the longer exposure is about 3' — it is of course considerably less on plate one. The overall magnitude was estimated as at least 8 — difficult because of full moon & fogging. Only the second plate was measured for position — being the better one for estimating the centre of the diffuse coma.

Both plates were centred around $2^h\ 48^m.0$ and +60°.

C/Ikeya-Shin 1967n. Oa-O Plate Tmuch good Full moon.

Exposure 6 mins. Mid LST corrected $14^h\ 27^m\ 31^s.6$ (about UT $23^h\ 17^m$)

~~Coma small diameter 3'.5 central condensation 0'.5~~. The plate is darkly fogged & no definite sign of the comet is seen in its position.

Plate centre $6^h\ 47^m.5$ + 59° 30'

1968

May 17-18 (night of Friday Saturday)

C/Tago-Honda-Yamamoto Plate Oa-O Transparency 6/10.

This is the first opportunity of observing this comet without moonlight. It was an easy diffuse object visually in 6" Mag est. at 7.5 vis. The 8 min Exposure from L.S.T. (mid. corrected) $14^h 45^m 46^s.2$

Drove with fixed web. Plate centred around $3^h 50^m + 61° 30'$

The image is clear. Coma is a very diffuse circular patch, with very little central condensation &, except for peripheral fading, of remarkably uniform brightness all over. Overall diameter 1'.5

May 17-18 continued.

C Ikeya-Seki Plate Oa-O Transparency 6/10

Exposure 6 min Corrected mid LST $15^h 57^m 31^s.2$

Drove with fixed web. Plate centred around $6^h 52^m.5 + 57° 0'$

Image of comet very weak & diffuse. Overall diameter of coma 3'. There is an almost stellar central condensation.

May 23-24 (night of Thursday-Friday). Thin cloud passing, low altitude Transp? 4-5/10

C/Tago-Honda-Yamamoto Exposure 12 min. Mid Cor. LST $15^h 1^m 33^s.5$

Drove fixed web — rather poor drive owing to clouds. Plate centred around $4^h 25^m + 60° 20'$

Outer coma is 3' in diameter. There is now greater concentration towards centre & a fairly small central nucleus. Magnitude estimated 8.0

Occultation (3)/1968.

May 30. 2 C. 1131. Mag 7.2 Sc. dark limb P.A ? ±100°

Observed disappearance LST $14^h 3^m 19^s.5$ ten (dark $2^s.2$ fast.

Corrected LST. $14^h\ 3^m\ 17^s.3$ sec

Observed U.T Sun. $22^h\ 15^m\ 23^s.0$

Owing to the thick haze at this very low altitude the star was, & became increasingly more so, difficult to see. There was therefore considerable uncertainty as to the exact time of disappearance and occultation.

Preliminary residuals from R.A Office give the distance of star from corrected limb at observed time as +5".31 — encouragingly small, considering observing errors & showing that the star disappeared in haze some 2-3 sec before occultation.

June 11 N.P.S. Check on orientation of polar axis

2 short exposures (3/4 min) were given at beginning & end of a clock-drive of 1 hour 52 minutes: an arc of 28°. The separation of the 2 images was 18" indicating an error of 3'.9 in axis, requiring correction of 36" in alt. & 8" in azimuth. This was carried out next day on Pole Star.

May 30-31 (night of Thursday-Friday) Plate Oca-O Transp 6/10 : but slight twilight & low altitude.
C/ Tago-Honda-Yamamoto. Exposure 20 minutes. Mid UT $17^h\ 1^m\ 28^s.8$ (May 31.0)
Comet in P.A. 38° ↙ in 5 minutes ($5'.9$) steps. Plate centred around $4^h 50^m.5 + 58^\circ 30'$
Fairly strong image of comet. Outer coma 3' diameter, more faintly marked central condensation about 0'.5 diameter. Integrated mag. 8.5

June 19-20 (night of Wednesday-Thursday) Plate Oca-O Transp 4-5/10 Much twilight & V. Low Alt.
C/ Ikeya-Seki. A last attempt was made to get this comet before it got too near the sun. The only possible times were just before & just after its lower culmination about midnight; and being midsummer there was very considerable twilight at this time near the NW & NE horizon. Two exposures were made one just before & the other just after midnight.
Exposure (1) 13 minutes Cor. mid UT $17^h\ 3^m\ 32^s.2$ About half the camera lens was obstructed by wall of dome. Telescope clear. Drive fixed well.
Exposure (2) 17 minutes Cor mid UT $18^h\ 11^m\ 34^s.3$. On this side of the hair the full aperture of the camera lens was unobscured by the wall, but the telescope lens was completely obstructed. It was impossible to guide & I had to rely on a fine drive — slight doubling of images resulting.
Both plates were centred around $7^h\ 11^m.5 + 48^\circ\ 15'.0$
On both plates one can make out very faintly a large very diffuse blur which is undoubtedly the comet.

1968.

C Whitaker Thomas 1968 f

June 20-21 (night of Thursday-Friday). News was received of discovery independently by Whitaker & Thomas of comet on June 15 & 17 respectively and giving an estimated daily motion of $+0^m.6$ & $+2°44'$ & magnitude 9. It was thought best to make a family by exposures with fixed orb on the predicted position & later to make an exposure driving on comet.

Exposure (1) C Whitaker Thomas Oa-O plate Transp. 5-6/10 Passing Clouds.
Exposure 22 min 29 Secs. Mid Gr LST = $17^h\ 12^m\ 18^s.0$ Drawn fixed orb

Exposure (2) C W-T. 10 min 2 Secs. Mid Gr LST. $18^h\ 55^m\ 4^s.4$
Drawn in PA 85° 20'  in 1¼ min – 8".1 – stars. Transp. 6-7/10
Both plates centred around $15^h\ 18^m + 18°$ mic cloud.

Exposure (1) does show a very strong heavily trailed image of the comet
Exposure (2) shows an outer diffuse coma with overall diameter of about 4'
& a moderately heavily condensed central condensation of about 0'.5 diameter
which is eccentrically placed towards 270° in outer coma (i.e. towards tail).
Estimated integrated magnitude 8.0.

C Whitaker Thomas 1968 f
June 23-24 (night of Sunday/Monday) Oa-O plates. Transp. 6/10.
Exposure (1) 15 mins Mid Gr. LST. $16^h\ 47^m\ 58^s.3$. Drawn in P.A. 85°40
in 2½ minutes 9".6 Stars
Exposure (2) 10 mins. Mid Gr LST $17^h\ 53^m\ 58^s.3$ Drawn with fixed orb.
Both plates centred around $15^h\ 22^m + 22°$

The image on Plate (1) is very strong. Outer diffuse coma 4' diameter & fairly heavily condensed central part 1' diameter. In Plate 2 the images are all Exceedingly faint (? not fully developed plates). In both plates the focus is poor.
Mag. est. visually in 6" & photographically as 9.0

1968

June 25-26 (night of Tuesday-Wednesday) Visual observation June 25.9

C. Whitaker Thomas. The comet was observed visually only in 6". It was very diffuse & difficult both visually & with condensation. Est visual mag 9.5

June 29-30 (night of Sat.-Sun.) Oa-O Plates Transp 8/10 Twilight ++ T=56°-56° F8

C/Whitaker-Thomas 1968b

Exposure (1) R.L.W. 22.5 min Cor. LST mid exp = $18^h 16^m 16^s.0$

Strong image of comet. Outer diffuse coma 3' diameter brighter moderately concentrated core about 0'.5. Then appears to be a small circular coma to C.C - not tackled like stars - in PA 20° Δ 30"

Exposure (2) (Peltier & Krevil) 22.5 min Cor. LST mid Exp $19^h 41^m 15^s.7$

This plate, which is less well defined, shows no sign of the ? coma to coma. Otherwise same as plate (1)

Both plates were driven with moving rod towards PA 82° Δ in 2½ minutes (5'.9) steps. They were centred at $\alpha = 15^h 25^m.0$ $\delta = +28° 59'$ (1968.5

Est mag visual & photo = 9.5

July 1-2 (night of Monday-Tuesday) Oa-O Plate Trans 3-4/10 T=70° F4.

C/Whitaker Thomas 1968b. also passing cloud, which affected exposure.

Exposure 16 min 1 sec. Cor. LST mid exposure = 18 23 1.3

Stars on moving rod towards PA 80° Δ in 2½ min (5'.0 steps)

Plate centred on $\alpha = 15^h 26^m 30^s$ $\delta = +30° 38'$ (1968.5)

Plate fogged & much cloud scattering round star images

Only guest with faint & diffuse image of comet.

1968

July 4·0 (night of Wed-Thurs) Plate Oa-O Transp 5/10. T=55°-52° F=9.
C/Whittaker-Thomas 1968b. Exposure 22·5 min Cor LST mid Exp = 18h 46m 19s·7
Drove with moving web towards PA 78° ↗ in 2½ min (4'·3) steps.
Plate centred at α = 15h 27m·8 δ = +32° 5' (1968)
Centre coma very diffuse 2·5 diam; moderately concentrated central condensation 0'·5 D
Est. photographic mag = 9·8

July 9·0 (night of Monday-Tuesday) Plate Oa-O Transp 3/10 in zenith. V. low altitude
C/Honda 1968c New comet discovered July 6·7 by Honda in Japan
A search plate was exposed for 7 minutes: during which was Full moon, Poor transparency & thick haze near horizon & very low altitude (just clear of wall)
Moreover an Id plate (Zeiss Id) was only one available.
As might be expected Plate was hopelessly fogged, very few stars & No sign of comet.
Exposure 7 min Cor LST mid exposure = 20m 51m 29s·3. Plate centred on
5h 8m·8 +40° 42' Fixed web. Observer Peth & Kewil.

July 18·0 (night of Wednesday-Thursday) Plates Oa-O.
I C/Whittaker-Thomas 1968b. Transp 7/10 T=58° F=9
Exposure 40 min RMW Cor LST mid Exposure 18h 30m 0s·3. Plate centred 15h 39m·3 +37° 55'
Drove with moving web towards PA 53° 22' ↘ in 10 min (7'·7) steps.
Comet shows an extremely diffuse coma 4'-5' diameter & strongly concentrated central part 0'·5 D
Est photo mag 11·0-11·5

II C/Honda 1968c Transp zenith 7/10. Bdr. low alt. 3rd Quarter Moon & Twilight +
Exposure 5 min. Cor. L.S.T. mid Exposure 20h 9m 30s·3. Plate centred 5h 10m·6 +44° 27'
Observer Peth & Kewil. Drove with fixed web. The comet is small but

1968

July 18 continued C/Honda 1968c

heavily condensed. Outer coma v. faint 1.5 diam. Strong central condensation (30)" diam
The comet was first picked up in 4" by P.J.K
Visual mag in 4" estimated (P.J.K + R.W.) 8.0 Phot mag est. 8.0

July 24.0 (night of Tuesday-Wednesday) Plates Oa-O. Transp 7/10 T=55° F=9
C/Honda 1968c Two exposures were made (1) long (2) short.
Exposure (1) 30 mins Gr LST mid exposure 20h 22m 6.s6 Stars moving well
Exposure (2) 4 mins Gr LST mid exposure 20h 57m 6.s8 Stars fixed well
Exposure (1) web was moved towards P.A 90° ↑ in 5 min steps of 3".9
Both plates centred on $\alpha = 5^h 10^m 10^s$ $\delta = +47° 3' 0$ (1968.5)
Visually the comet was bright in 6" and vis mag estimated at 7.5
Plate (1) Very strong image of comet. Inner coma heavily condensed about 1.5 diameter. Outer coma increases to diameter of 5'. There is a wide but very faint & diffuse tail from PA 260°-340° composed of streamers the most definite being 2' long in 280° & 4' long in 260° & 340°. There is also a broad surrounding "beard" about 2' long in 130°. This is rather stronger than the others.
Mag Photo est about 7.5.
Plate (2) This short exposure shows good star images & the comet with heavily condensed 0.5 centre & overall coma to 1.5.

July 28.0 (night of Sat.-Sunday) Plate Oa-O Transp 4/10 T 56°-55°. F=9
C/Whitaker-Thomas 1968f. Exposure 50m 4s Gr. L.S.T mid Exp = 20h 4m 7.s2
Plate centred at 15h 49m 20s +39° 37.0 (1968.5). Stars moving well
towards PA 28° ↖ in 10 min (6.0) steps. continued →

1968

July 28·0 continued C/Whitaker-Thomas 1968 b.

Comet image faint. A very faint diffuse outer coma of about 2'·5 diameter with central condensation - almost stellar, but elongated PA 140°–320° about 30" long. Mag of central condensation about 14; integrated mag. about 12·0–12·5

(night of Sunday-Monday)
July 29·0 C/Honda 1968 c Oa-O plate Transp 4/10 increasing cloud T=56° F=9
Exposure 3 minutes – Fixed wedge. Corr. UST mid Exp = 20h 55m 38s·3 Plate centred at 5hm 8h 24s + 50° 13'·5 (1968·5). Stars in image of comet a good sharp images Outer coma out to about 1·0 diameter dense central condensation about 20" diameter Est. integrated mag. via a photo 7·0

July 31·0 (night of Tuesday-Wednesday) Oa-O plate Transp 3-4/10 T=57° F=8
C/Honda 1968 c Exposure 40 mins Corr UST mid Exp. 21h 19m 6s·3 Plate centre 5h 7m 36s + 51° 29'·5 (1968·5). Drive moving wedge towards PA 84°30' Δ in 5 min (8"·1) steps. Stars image of comet. Central condensation 1' diam. Outer coma about 3'·5 diameter Very faint diffuse tail towards P.A 280° about 6' long. The poor transparency was doubtless the reason why this plate shows less extension & detail than the 30 min exposure of July 29·0. Est mag photo. = 7·0

Aug 14·0 (night of Tuesday-Wed) Oa-O plate Transp 6/10 but passing cloud. T=58° F=8
C/Honda 1968 c Exposure 2 min. Corr UST mid Exp 19hm 29m 0s·5 Plate Centre 4h 51'·6 +64° 3'·5 (1965·5)
Drive fixed wedge. (2 min motion in 6"·03 in PA 79°43' Δ) Stars image. Outer coma 2' diam Heavily condensed central condensation 30" diameter. Visually bright in 6". Visual Phot mag est = 6·0

Occultation (4) 1968

Aug 16·0 Z.C.0486 Mag 5·2 Reappearance Dark limb P.A. 216°

The age of moon was 21·0 days. The radial distance of the star from the Terminator at reappearance was found to be 14'.4 (a 33.6 Revolution of Micrometer Screw). The position wire was placed radially across the moon, the distance wire was placed so that its intersection with position wire was on the terminator: the star, at distance of 33·6 revs, was, at its intersection with the position wire, on the point of the limb where star would reappear. Good quality, reappearance instantaneous.

Obs L.S.T. was $22^h 43^m 7^s.5$ fast on clock $1^s.0$ slow

Obs. or LST = $22^h 43^m 8^s.5$ → Aug 16 $1^h 15^m 9^s.8$ U.T. Reappearance.

Preliminary residuals from NA after given distance of star from correct limb as $+0''.54$

1968

Aug 19·0 (night of Sunday–Monday) Oa-0 Plate. Transp 6/10 T = 56°-53° F8.
C/ Honda 1968c. Exposure 25 min. Gr. UST mid Expn = 19h 32m 33s.1
Plate centred at 4h 36m 5s +70° 47'·0 (1968·5). Drove with moving web towards P.A 73°·0 ↗ in 2½ min (10"·19) steps.
Strong image of comet. Inner condensation very heavily concentrated 2'·0 diameter. Outer coma traced to about 6' diameter. Diffuse fan tail with faintly sharp & narrow central spine about 13' long in PA 280°. Plate magnitude ± 5·5
N.B. Two large emulsion flaws S but clear of comet – but others smaller, are nearer!

Aug 23·0 (night of Thursday–Friday) Oa-0 Plate Transp 6/10 T = 66°-63° F6.
C/ Whitaker Thomas 1968b Exposure 90 min. Gr. UST mid Expn = 20h 25m 22s.6
Plate centred at 16h 22m·8 +40° 28' (1968·5). Drove with moving web towards PA 0° ← in 5 min (4"·16) steps. Good plate: fine, clean & negligible fogging. But no sign of comet. Presumably faint tail may lie

Aug 26·0 (night of Sunday–Monday) Plate Oa-0 Transp 6/10.
C/ Bailey-Jurbain — Clayton 1968d (K) New comet discovered on Aug 24 during S-W Astronomical Conference in New Mexico. Just runs of film on Aug 25 evening giving 2 approximate positions, and exposed a plate the same evening – about 2 hours before midnight.
Exposure 20 minutes Gr. UST mid Expn 20h 9m 8s.7 Plate centred at 18h 58m +32° 15' (1968·5)
Drove with moving web towards P.A 27°40' ↗ in 5 min (14"·1) steps. Strong image of comet: heavily condensed central condensation 30", very faint outer coma to about 3' diameter
Integrated mag est = 10·0

1968

Aug 27·0 (night of Monday-Tuesday) Oa-O Plate. Transp 6/10 T 65°-64° FG
C/Bally-Urban-Clayton 1968d Exposure 7·5 minutes. Cor LST mid Exp = 20h 10m 52·4s
Drove with moving web towards PA 11° 9' ← in 2½ minute (6·5) steps.
Thin short exposure shows a faint near stellar central condensation with very faint, diffuse outer coma about 2' in diameter. Phot mag integ. est. 10·0

Sept. 1·0 (night of Saturday-Sunday) Oa-O Plate Transp 7/10 T 57°-55° Fq.
1) C/Bally-Urban-Clayton 1968d Exposure 20 min Cor LST mid exposure 20h 37m 35·5s
Plate centred at 18h 33m·0 +32° 55' (1968·5). Drove with moving web towards P.A. = 8° ← in 2½ min (5·4) steps. Strong image of comet. Central condensation heavily condensed 30" diameter; faint outer coma to about 2' diameter. Appears slightly fainter than on 25·9 : Est Photo mag = 10·5

2) C/Honda 1968c Oa-O plate Transp 7/10 T = 55°-53° FG.
Exposure 17 mins. Cor LST mid Exp = 22h 28m 35·5s. Plate centred at 19h 26m 35s +76° 42'·5. Drove with moving web towards P.A. 63° 50' ↙ in 1 minute (7"·8) steps. Very strong image of comet: Central condensation (heavily condensed) about 2' diameter, outer coma about 6' diameter. Near linear tail 1° long towards PA 130°. The coma is hooded, curving backwards symmetrically on either side of narrow tail. Photo mag = 5·0

1968

Sept. 7.0 (night of Friday - Saturday) Oa-0 plate Transp ? Full moon

C/ Honda 1968c Exposure 2m 4sec LST corrected of Mid Expn 19h 34m 8.5s

Plate centred at 18h 26m 25s + 58° 7' (1968.5) Arrow on moving web towards P.A. 80° 2' ↓ in 1 minute step of 8.3. Owing to full moon & dark plate only 2 minutes exposure the plate is fairly heavily fogged. The image is considerably stronger than on Aug 14 (with similar exposure) Central condensation 45" outer coma 4' diam. Integrated mag est at 5.0.

Sept. 10.0 (night of Monday - Tuesday) Oa-0 plate. Transp 4/10 Bright last Quarter moon

C/ Bally - Urban - Clayton 1968d. Exposure 15 mins. Corr LST mid Expn = 20h 1m 33.9s

Plate centred at 18h 7m.2 + 32° 53'.5. Arrow with moving web towards P.A 0° → in 5 min (6'.6) steps. The plate is fairly heavily fogged by moonlight. The comet image is clear: Central condensation Stellar 10" diam outer coma faint to 2'.5 diam. Est integrated mag = 11.0

Oct. 15.0 (night of Monday - Tuesday) Oa-0 plate Transp 7/10

1) C/ Bally - Urban — Clayton 1968d. Exposure 35 mins. corr LST mid Expn = 21h 26m 30.7s

Plate centred at 17h 30m.0 +32° 2'.0. Arrow with fixed web (v. slow motion) good plate: no fogging good star images. Comet very strong but small Extremely heavily condensed central condensation — almost stellar — 10" diam Very faint & diffuse outer coma 5' in diam. Integrated mag est. 11.8.

2) C Honda 1968c Exposure 10 mins. Corr. LST mid Expn 20h 20m 12.2s

Plate centred abt 18h 8m 30s δ = -6° 0'. Arrow with fixed web. Image comet strong: heavily condensed central condensation 30" diam. Faint outer coma 3' diam Integrated photographic magnitude estimated at 7.8 mag

1968

Oct. 29·0 (night of Monday–Tuesday) Plate Oa-O Transp. 7/10. T = 50°

C/Wild 1968 f – a new comet discovered in Berne on Oct. 17. reported to be mag 15 with daily motion −2ᵐ·65 in α; −17′ in δ. It was decided to give a 40 minute exposure + clock on fixed wch owing to uncertainty in Daily motion: Exposure 40 mins: cor. LST mid Exposure = 1ʰ 34ᵐ 4ˢ·6

Plate centred at 2ʰ 28ᵐ 50ˢ + 36° 3′. Given with fixed wch. Owing to the presence of at least 2 very faint nebulae in the close vicinity of comet's position there was at first doubt as to which if any of 3 objects was the comet However the matter was decided by reference to Franklin Adams Charts + NGC which showed two of the 3 objects were nebulae, and that the 3rd (midway in brightness between the other two) must be the comet. Precise measurements later confirmed this. The image of the comet is an extremely faint + diffuse patch of light (0·5 × 1·0) being elongated towards PAs 60° and 240°. (The dimensions + PAs of the elongated image corresponded with the reported daily motion given above). No significant condensation could be detected in the image. The integrated mag was estimated at 14·0

Nov. 4·0 + 5·0 (night of Sun–Mon, + Mon–Tues) Plates Oa-O Transp 4/10 Twilight

C/Honda 1968c. On both these evenings attempts were made to photograph the comet before it went too far South. Evening twilight + haze near horizon resulted in no image being obtained, + the plates being badly fogged

(1) Nov. 3·75 5 min exposure Mid exp. was LST 21ʰ 4ᵐ 29ˢ·0 Centred at 18ʰ 15ᵐ − 14° 4′

(2) Nov. 4·75 6 min exposure Mid exp. was LST 20ʰ 58ᵐ 0ˢ·2 Centred at 18ʰ 18ᵐ·8 − 14° 20′

Occultation (5) 1968

1968 Nov 8 Z.C. 0885 Mag 5.6 Ruffhead Outer Hill PA 274°

The calculated radial distance from reappearing star to termination was 3' 27" = 8.04 Rev of micrometer screw. The star reappeared close to the intersection of the wires

Observed reappearance was LST $24^h\ 58^m\ 25^s.0$ + correction (clock $1^s.5$ Fast

∴ corrected time was $24^h\ 58^m\ 23^s.5$ LST

This corresponds to:

Time of Reappearance = $21^h\ 55^m\ 50^s.3$

Publishing sendwich from NA office enquiries my time as 21 55 50.8, and give resulting distance of star from corrected limb as + 0".66

1968

Dec. 12·75 (Thursday evening) Plate 0a-0 Poor Transp., Haze

An attempt to get a last plate of C/ Bally Urban Clayton 1968d was made; but there was no success owing to poor sky & comet getting low in the west. Exposure 38ᵐ20ˢ. Gr LST mid Exp. 23ʰ 5ᵐ 27ˢ·8 Plate centred at 17ʰ 56ᵐ·0 +37° 50′ 1968. Drove with moving web towards PA 54° ↗ in 10 minutes (6″·7) steps. No sign of comet on plate

Dec. 16·75 (Monday evening) Plate 0a-0 Poor Transp. Haze. Much passing cloud. C/ Bally Urban-Clayton 1968d. This was the final attempt on this comet & also failed. Trail of interrupted exposure 35ᵐ 45ˢ. approx time of corrected LST of mid exposure 24ʰ 33ᵐ 47ˢ. Drove & moving web towards PA 55° ↗ in 10 min. (6″·8) steps. Plate centred at 17ʰ 59ᵐ +38° 49′. No sign of comet.

Plate Measurement Jan 8·75 C/Thomas

Plate I Jan 8·78362 $4^h 33^m 59^s.62$ $+81° 30' 12''.2$ (1950·0)

6 stars used 81°156, 81°157, 81°161 Ds = ·346960, ·345277, 307763

BD 81°151, 80°142, 81°165 Ds = ·232037, ·343222, 424721

Resg $\Delta = 1''.2$ $\delta = 1''.8$ Direct mean from the 2 reductions (3 other stars measured but discarded)

Plate II Jan 8·86615 $4^h 33^m 51^s.40$ $+81° 29' 52''.2$ (1950·0

6 stars used BD 81°156, 81°157, 81°161 Ds = ·339994, ·368841, 291165

BD 81°155, 80°142, 81°165 Ds = ·310225, ·356009, 333766

Resg $\Delta = 0''.7$ $\delta = 0''.8$ Direct mean from 2 reductions.

Plate Measurement Jan 14·75 C/Thomas

Plate I Jan 14·78746 $4^h 27^m 54^s.78$ $+81° 2' 47''.0$ (1950·0)

6 stars were used 80°136 80°138 80°143 Ds = ·361173 ·133510 ·505317

BD 81°144 81°157 80°144 Ds = ·183296 ·575647 ·241057

Resg $\Delta = 0''.7$ $\delta = 1''.1$ Direct mean from 2 reductions (3 other stars measured but discarded)

Occultation (1) 1969 Jan 23 ZC 0132 Mag 6·9 Diffraction D.L. PA 118°

Obs LST Dis = $3^h 30^m 29^s.0$ + corr (clock fast 6 secs) ∴ corr LST Dis = $3^h 30^m 30^s.6$

i.e. $4^h 28^m 43^s.1$ UT. Prelim NA residual from Gr. limb $-0''.68$

Occultation (2) 1969 Jan 28 ZC 0746 Mag 6·8 Diff. D.L. PA 45°

Obs LST Dis = $1^h 58^m 10^s.0$ + corr (clock 1½ slow) ∴ corr LST Dis = $1^h 58^m 11^s.4$

i.e. $17^h 36^m 59^s.5$ UT Prelim NA residual from Gr limb $-0''.44$.

1969

Jan 8·75 (night of Wednesday-Thursday) Oa-O plates

C/Thomas 1968 J This new comet was discovered on Dec. 14 by Thomas at Lowell Observatory. Though I got the news about 2 days later the weather prevented any observation before 1969 Jan. 8. Comet reported to be of mag 13 and having a daily motion of about 2° in 10 min. R. South was here & we got 2 exposures.

Exposure I 50 min stopped by cloud. Transp 6-7/10 Observer R.L.W. on UST mid expn $1^h\,50^m\,5^s$ (U.T. $18^h\,48^m\,24^s.4$) Drive on fixed web

Exposure II 20 min Transp 7/10 (some passing cloud) Observer R. South on UST mid Expn $3^h\,50^m\,7^s$ (U.T. $20^h\,47^m\,14^s.9$)

Both exposures: plate driven on a fixed web.

Plate I, the longer exposure shows heavily condensed central condensation 20" diameter with faint coma 1·5 diameter. Also 2 nearly linear thickenings (1) about P.A. 90° 2' long & (2) about PA 150° 1·5 long. Integrated mag est 12.5

Plate 2, shorter exposure shows little more than the central condensation & only a suggestion of surrounding halo — but probably more suitable for measurement

Jan 14·75 (night of Tuesday/Wednesday) Oa-O plates Transp 7/10.
C/Thomas 1968 J.
Exposure I 40 minutes on UST mid Expn = $2^h\,20^m\,9^s.2$ Transp 7/10 — no cloud.
Exposure II 38·5 minutes on UST mid Expn = $3^h\,37^m\,44^s.2$ Transp 7/10 — only passing cloud.
Plates centred at $4^h\,29^m.7$ +81° 3'. Driven with fixed web.
The image of comet is small, but strong: heavily condensed central condensation about 20" diameter. Very faint & diffuse outer coma 1·5 in diameter — on both plates.
On Plate I there is the doubling of the nucleus — due to a faint star, which is clear of comet on Plate II. Integr. mag est. at 13.0

Plate measurement Mar 7.8 C Thomas

Mar 7.84068 : $5^h\ 45^m\ 13^s.58$ $+73^\circ\ 47'\ 18''.1$ (1950.0)

6 stars used $73^\circ 297$, $74^\circ 259$, $73^\circ 306$ Ds = ·466162, ·151693, ·382144

BD $74^\circ 254$, $73^\circ 301$, $73^\circ 309$ Ds = ·367800, ·341316, ·290885

Range: $\Delta = 0''.21$ $\delta = 1''.0$ Final mean from the 2 reductions

Occultation (3) 1969 March 27 Z.C.1211 Mag 6·2 Dis. DL PA 54°

Obs. Dis. Tim. $8^h\ 18^m\ 49^s.0$ + corr (clock $5^s.3$ slow) ∴ Corr Dis Tim = $8^h\ 18^m\ 52^s.3$

i.e. $20^h\ 8^m\ 35^s.3$ U.T Parallax reduction from Cordoba (N.A.O) $-0''.23$

Plate measurement Apr 5·0 C Thomas

Apr 4·88202 $6^h\ 55^m\ 48^s.37$ $+68^\circ\ 11'\ 21''.9$ (1950.0)

9 Stars were measured, but one star was discarded; one of the remaining 8 stars was used twice over (i.e. in 2 of the 3 reductions)

BD 68°457, 67°468, 69°405 Ds = ·551636, ·294395, ·153969

BD 67°461, 68°460, 67°476 Ds = ·165713, ·656826, ·177460

BD 67°461, 68°459, 68°464 Ds = ·268820, ·491336, ·239844

Equal weights were given to each star in the final mean: so BD 67°461 (twice used) was given in the two cases only half the weight of the other 7 stars

Range $\Delta = 4''.2$ $\delta = 1''.0$

1969

C/Thomas 1968 I

Mar 7.8 (night of Friday-Saturday) Oa-O plate Transp. 5/10 T=43° E=13

After several weeks of bad weather an attempt was made last night (Mar 6.8) to photograph C/Thomas; but owing to its nearness to the zenith there was difficulty in finding a guide star before moon rose. Tonight (Mar 7.8) we got a good guide star — but the position was too difficult to use the micrometer so I had to guide with a fixed web (in Hoyghens eyepiece a star diagonal). This meant considerable trailing of comet (as it was moving 6".1 in 10 mins towards PA 46° ↙), so that the plate was only of use for position measurement of comet. The plate shows trailed comet (60 minute exposure → 37" trail) but the relative size of central condensation & other comae effects much as in Jan 29 and the photographic integrated mag was estimated at 13.0 – 13.5.

Exposure 60 mins. G.S.T. mid exposure 7h 2m 1.0s. Plate centred at 5h 39m 12s + 73° 58'. Observers R.L.V. & R.H. South for start of exposure.

April 5.0 (night of Friday-Saturday) Oa-O plate Transp. 6-7/10

C/Thomas 1968 I Exposure 60m. G.S.T. mid Exposure 9h 52m 5.8s Plate centred at 6h 45m.5 +68° 53' Driven with moving web towards PA 46.2 ↙ in 10 minute (9".0) steps. Comet shown as a small cross with fairly sharp stellar condensation at intersection of arms — the strong arm being 45" long in PA 70°–250° — and the other arm enclosing a faint halo of light 40"-45" in width. Integrated photo mag estimated at 13.8

Plate measured Apr. 8.0 C/Thomas

April 7.89156 $7^h\ 3^m\ 8^s.73$ $+67°\ 31'\ 46''.1$ (1950.0)

4 stars were measured 67°473, 67°476, 68°464 Ds = ·169539, ·718132, ·112328

BD 68°459, 67°468, 67°482 Ds = ·266715, ·314090, ·419495

BD 67°461, 66°488, 69°405 Ds = ·273157, ·449147, ·277695

Final mean from 3 reductions. Range $\Delta = 2''.5$ $\delta = 2''.1$

Plate measured Apr. 9.0 C/Thomas

April 8.91127 $7^h\ 5^m\ 36^s.94$ $+67°\ 18'\ 16''.0$ (1950.0)

4 stars were measured BD 67°476, 66°488, 67°480 Ds = ·653802, ·197073, ·149125

B.D. 67°475, 68°464, 67°482 Ds = ·611936, ·166600, ·221414

B.D. 67°473, 66°490, 67°483 Ds = ·594527, ·244055, ·161417

Final mean from the 3 reductions Range $\Delta = 0''.9$ $\delta = 0''.7$

North Plate Square Apr. 15.

Good plate with 40 minute exposure shows 16.0 mag stars easily, and 16.4 fairly clearly.

1969

T 55.5° Fq

April 8.0 (night of Monday-Tuesday) Oa-O plate Transp 6/10 detached, stopping exposure E/Thomas 1968 J Exposure 35 minutes (stopped by cloud) GST mid Expn 10h 17m 42s.4 Plate centred at 7h 1.0 +67°30'. Drove with moving coil towards PA 44° ↙ in 10 minutes (8") steps. Comet image close to faint star. Central condensation near stellar 20" diameter with surrounding haze about 40" diameter Est integrated mag about 13.8

April 9.0 (night of Tuesday-Wednesday) Oa-O plate. Transp 7-8/10 T=55-50° Fq. E/Thomas 1968 J. Exposure 90 mins 10h 50m 7s.2 GST mid Expn. Plate was centred at 7h 8.0m +67° 15' (1969) Drove with moving coil towards P.A. 45° ↙ in 10 min (8".0) steps. The plate is good with sharp round image. Central condensation, very heavy, 20" diameter, faint diffuse extension about 3'.0 diameter. Integrated mag est as 13.8

W. Polar Sequence

April 15.0 (night of Monday-Tuesday) Oa-O plate Transp. 7/10 T 45°-42° F 12.
Exposure 90 min GST mid Expn 11h 34m 56s.8
Plate centred on PSC Star 2h 2m 30s +89° 7'
As there was some error in the clock-rate I drove in RA only on Polaris. This reduced the clock-error from the PSC Star to all hour circle readings to a negligible amount. Stars of mag 16.0 (including one of 16.02) were clear & easily measurable whereas faint stars including one of 16.19 & one of 16.40 were faint and quite definite.

AV around pole, star-images show no distortion from irregular limits.

Plate fogging is only very slight. The mid exposures were about 22 hours V.T. no moonlight.

Plate Measured May 19·0 C/Thomas

May 18·98435 $8^h\ 33^m\ 35^s.99$ $+57°\ 46'\ 30''.8$ (1950.0)

Nine stars measured (6 used for result)

ref used → B.D 58° 1136, 57° 1155, 58° 1140 Ds = ·127287, ·718909, ·153805

used → BD 58° 1130, 57° 1154, 57° 1166 Ds = ·409 291, ·331267, ·259443

BD 58° 1125, 57° 1159, 58° 1145 Ds = ·365874, ·454655, ·179471

Direct mean from the 2 reductions used. Range $\alpha = 0''.6$ $\delta = 0''.8$

[Range from the 3 reductions (including discarded one) $\alpha = 1''.5$ $\delta = 0''.8$]

Occultation (4) 469 May 19· ZC1013 Mag 6·9 Dis 0L PA = 139°

This occultation was observed in duplicate by H. H. Morgan using 4" Wray and R. L. W using 6" Cooke

Obs Ist Dis RMW $13^h\ 23\ 1^s.5$ H.H.M $13^h\ 23^m\ 2^s.0$

Corr Ist Dis (clock $0^s.93$ slow) $12^h\ 23^m\ 2^s.43$ RMW $13^h\ 23^m\ 2^s.93$

This gives U.T $21^h\ 43^m\ 32^s.4$ RMW and $21^h\ 43^m\ 32^s.9$ H.H.M.

Prob. residual from Cr Limb from NAO: $-0''.16$ RMW $-0''.36$ H.H.M.

1966

May 19·0 (night of Sunday-Monday) Oa-0 Hunter. Transp 7/10 T 43·40 Fiz
C Thomas 1968 J Exposure 100 minutes on LST mid Exp = 15h 33m 1·2s
Plate centred at 8h 35·2m +57° 42'. Drove ē moving west towards 43·4 ↘
in 10 minute (9·0) steps. Coma appears fairly strongly condensed
Central condensation 20" diameter Outer coma faint & diffuse 2' diameter
Thin, straight radial spike about 3' long in PA 0°. Integrated mag est at 14·5

June 8·0 (night of Saturday-Sunday) Oa-0 Hunter. Transp 6/10 Midsummer twilight considerable all through exposure
C/Thomas 1968 J Exposure 110 minutes. In spite of being centered close to local midnight the summer twilight caused heavy fogging of plate.
Corr LST mid exposure was 17h 8m 7·1s. Plate centred at 9h 12·5m +52° 44'
Drove with moving coil towards PA 42·1 in 10 min (9·26) steps
There is absolutely no sign of the comet close to the ephemeris position — which is known to be closely correct. One can I think put the integrated mag of the comet as fainter than 15·0 mag

July 9 22h 50m U.T. (LST 17h 50m 57s – 18h 20m 57s) Plate Oa·0 Transp 8/10
M 13 Hercules Exposure 30 mins guided by D. Lacombe
The sky cleared suddenly and it was decided to let D.L. have a practice ~~shot~~ on M.13 There was insufficient time for the telescope to get steady — hence poor focus. But guiding was good.

C Kohoutek

Plate Aug 6.0. This plate was not measured [illegible] owing to defects in [illegible] the star images ~~the results were discarded~~ partly due to temperature change during exposure

1969

July 31·0 (night of Wednesday-Thursday)

?New Comet. Was shown by (? G. Milburn) to say that Alcock had seen on previous night a faint object which he thought might be a comet; but owing to moonlight & encroaching cloud he had been unable to confirm or discard it. I therefore made 3 exposures of times ranging between 5 and 15 minutes; as owing to rising nearly full moon it was not possible to judge an optimum exposure time as Alcock had suggested a motion of about 21" in 20 minutes in PA 14°

Expn (1) 15 mins on UST mid Expn 18h 12m 36s·4 moving web

Expn (2) Shutter jammed.

Expn (3) 5 min on UST mid Expn 19h 18m 36s·4 fixed web.

Both plates were fogged Plate I very heavily (known Plate II is good enough to show that no comet near to mag 10 was present in the unfogged portion

Aug 6·0 (night of Tuesday-Wednesday) Oa-O plate. Transp 6-7/10 T=62°-58° F=7

C/Kohoutek 1969 b This new comet was discovered July 29 at Bergedorf The announcement was made July 29 - but this is the first clear night since then. Comet reported as mag 14·0 and daily motion available.

Exposure 45 mins on UST mid Expn = 18h 52m 30s·7 Plate centre 19h 21m·8 +29° 0' 1969.5

Drive moving web towards P.A 22°35' in 10 min (10"·8) steps.

Guided by H.H Morgan.

Comet image very strong: quite circular disc 25" diam* with almost sharp outline & no sign of surrounding outer coma. The* nucleus is slightly excentric. Mtg Magnt. 14·0

Plate measurement Aug 7.0 C/Kobenhavn

Aug 6.92117 $19^h 18^m 35^s.44$ $+28^\circ 38' 28''.9$ (1950)

Owing to there being a considerable discrepancy between the various reductions made from 9 stars (possibly due to comet being some distance from plate centre) amounting to 4" or 5" these measurements were discarded & not sent to I.A.U.

Measurement of Plate Aug 8.0 C/Kobenhavn

Aug 7.97731 $19^h 16^m 35^s.54$ $+28^\circ 44' 18''.2$ (1950.0)

Six stars were measured:

BD 28°3264, 28°3282, 28°3294 Ds = .132616, .746614, .120771

BD 28°3261, 28°3262, 28°3295 Ds = .256067, .085536, .658397

Range $\alpha = 0''.3$ $\delta = 0''.7$ Exact mean from the 2 reductions were used.

Measurement of Plate Aug 20.0 C/Kobenhavn

Aug 19.92204 $19^h 54^m 55^s.56$ $+29^\circ 24' 39''.2$ (1950)

Nine stars were measured. BD 29°3394, 29°3409, 29°3422 Ds = .418272, .176997, .404731

And → BD 29°3382, 29°3410, 29°3425 Ds = .307257, .238994, .453749

Discarded → BD 29°3402, 29°3427, 28°3145 Ds = .704933, .151292, .143775

The measurements were made on the centre of the coma; but later it was noticed that the central condensation was slightly eccentric in the coma: requiring a correction of $\alpha - 0''.05$ & $\delta - 1''.5$

The direct mean of reductions (1 & 2) was taken & the above correction added.

The 3rd reduction with poorer images was discarded

Range Rds (1+2) $\alpha = 0''.8$ $\delta = 0''.2$ Reduction (1) (2) & (3) $\alpha = 2''.9$ $\delta = 0''.6$

1969

Aug 7.0 (night of Wednesday-Thursday) Oa-0 Plate Transp 7-8/10 T: 60°-57° F7
C/Kohoutek 1969 f Exp. 45 minutes cor UT mid Expsure 18h 57m 30.7s
Plate centred 19h 14m.0 +29° 1.0 (1969) Drove with moving arc toward PA 14°15'
in 5 min (8".5) star. Guided by H.H. Morgan. (P.A 14°15' ←→)
The comet is immediately following the trail of a bright star. The coma is much more diffuse than on previous night about 45" diameter, irregular in shape with faint nucleus. Est integrated mag = 14.0

August 8.0 (night of Thursday-Friday) Oa-0 Plate. Transp 6/10 T: 60° F:7
C/Kohoutek 1969 f Exposure 65 min cor UT mid Exp 20h 29m (22) 31.1s
Plate centred at 19h 11m.0 +29° 10' (1969.0). Drove with moving arc towards PA 14° 15' ← in 5 min (8".5) star R.L.W.
The comet image between two faint star trails is very like last night: diffuse and 50" diameter, elongated (? short tail) towards PA 145°, faint nucleus. Est integrated mag = 14.0
[Aug 14.0 C/Fujikawa See next page]
August 20.0 (night of Tuesday-Wednesday) Oa-0 Plate. Transp 8/10 T=58° F=8
C/Kohoutek 1969 f Exposure 40 mins cor UT mid Exp 19h 50m 1.7s
Plate centred at 18h 55m.6 +29° 28'. Drove with moving arc towards P.A 6° 10' ← in 5 min (4".8) star. Guided by H.H. Morgan.
Comet image is close alongside, but separated from a faint star trail. The coma now is again extremely condensed: a compact little disc 20" diameter without any sign of outer coma or tail. It is even smaller & more compact than on Aug 6.0 (see I.A.U. Circular 2166)

Plate measurement Sept 4·0 C/Kharadeh

Sept 3·86895 $18^h\ 31^m\ 44^s\cdot28$ $+29^\circ\ 19'\ 57''\cdot0$ (1950)

Nine stars were measured; but 3 were discarded

used → B.D. 29°3280, 28°3020, 29°3302 Ds = ·289408, ·519085, ·191507

→ B.D 29°3275, 29°3288, 28°3027 Ds = ·101765, ·760928, ·137307

Discarded → B.D 28°3016, 29°3285, 28°3030 Ds = ·224768, ·540478, ·234753

Range between used reductions $\alpha = 0''\cdot7$ $\delta = 0''\cdot8$

(Range between all 3 reductions including discarded are $\alpha = 3''\cdot4$ $\delta = 0''\cdot8$)

1964

(night of Wed-Thursday)

Aug 14·0 / New Comet discovered by Fujikawa, at Onahara 7 afternoon Aug 12·7 Mag 11·0

C/ Fujikawa 1964 d Oa-O Plates Transp 6/10 Bad v. low altitude and only a short time before Twilight

This was the only attempt made at Oosterbroek to photograph this comet as it was only visible low in the eastern sky just before dawn and soon getting near to the sun. Two plates were exposed

Expn I 8 mins Co LST mid exposure 23h 39m 58·4s

Expn II interrupted by clouds, intermittent between LST 0h 12m 0s → 0h 21m 0s

Total time all about 6 3/4 minutes.

Neither plate showed any sign of comet after a careful search

Comet certainly fainter than mag 11.

Sept. 4·0 (night of) Wed-Thursday) Oa-O Plate Transp 6/10 T=61-66° F:7

C/ Kiboutch 1964 b. Expn 45 min Co LST mid Expn = 19h 32m 30·4s

Plate centred at 18h 32m 5 +29° 19' (1964·7) Drove with ~~Rowing~~ West towards P.A 4° ⟵ in 5 minute (3"·9) steps. Guided by David Larcombe

The comet is very small but image is strong. The head is very compact & dense about 15" in diameter with no surrounding haze. There is a sharp tail: 2 straight fairly narrow streams towards PA 150° 90" long & towards PA 140° 60" long.

Est. integrated Mag = 13·7

Plate measurement Sept 20.0 P/ Honda Mrkos Pajdusakova 1969e

Sept 20.16810 $9^h\ 41^m\ 50^s.69$ $+14^\circ\ 37'\ 28''.7$ (1950)

9 stars measured BD 15°2103, 14°2141, 14°2146 Ds: .756600, .733334, .110065

B.D. 14°2129, 15°2107, 14°2143 Ds: .333537, .303858, .362575

B.D. 15°2098, 14°2135, 15°2116 Ds: .444500, .298540, .256960

The measurements are poor because of the wedge-shaped trails & the agreement when the 3 reductions were manually poor

a direct mean of the 3 reductions was used

Rough $\alpha = 3''.6$ $\delta = 3''.5$

Occultations (5-9) 1969 see Next Page →

Occultation of Pleiades 5 observed: 1 Disappearance & 4 Reappearances

Plate measurement Oct 2.0 C/Kowalski 1969b.

Oct. 1.81431 $18^h\ 6^m\ 6^s.30$ $+27^\circ\ 50'\ 5''.6$ (1950)

Nine stars measured: B.D 28°2926, 27°2961, 27°2969 Ds: .276554, .620941, .102505

only 6 stars used → B.D 27°2956, 28°2928, 27°2974 Ds: .586433, .198293, .215276

(3 discarded) B.D 27°2946, 28°2939, 27°2975 Ds: .501440, .188672, .309888

Rough in 2 used reductions $\alpha = 0''.1$, $\delta = 1''.3$

Rough in 3 reductions including discarded one $\alpha = 1''.7$ $\delta = 2''.1$

1964

Sept. 20.0 (night of Friday-Saturday) P/ Honda-Mrkos-Pajdusakova 1964e This comet was recovered by Mrkos on August 12 at mag 14 0 only 6' from predicted position. Because of weather I was unable to try for this comet until this early morning. The comet was low in the sky shortly before dawn

P/H-M-P 1964e Oa-O plate. Transp 6/10 – but low altitude

T 46°-45° F 12.

Exposure 20 mins. Cor IST mid Exp. 3h 46m 31.9s Guided by H. H. Morgan. Drove with moving web towards PA. 46° 32' ↙ in 2½ min (7.0) steps. Plate centred on 9h 42m 25s + 14° 40' (1964.5).

The image of the comet is strong; moderately well condensed coma 30" diameter Octr coma 2' diameter. Integrated Mag est at 8.5

Venus is a few degrees S of the comet. The plate is taken just for measurement as owing to changing transparency the star trails are wedge-shaped.

Oct 2.0 (night of Wed-Thursday) Oa-O plate Transp 5/10 but passing Cloud T 47°-47° F 11.

C/Kohoutek 1964 b Exposure 30 mins - Cor IST mid Exp. 20h 4m 0.6s

Plate centred 18h 7m.1 + 27° 50' (1964.8) Drove with moving web towards PA. 29° 30' ↘ in 10 min (3.2) steps. An intended 40 min exp was stopped by cloud after 30 mins. Integrated mag est at 13.0

Coma small condensed 20" diameter Tail narrow fan in PA 120°-130° about 60" long

Occultation of Pleiades Sept 30 (night of Monday - Tuesday)

Occultation (5) 1969 Sept. 30. ZC.0541 Mag 4·0 Dis. Bright Limb P.A. 84°.

Observed Disappearance LST $2^h 25^m 30^s.5$ (+cor Clock 2·0 Fast) cor LST = $2^h 25^m 28^s.5$

∴ UT Observed Dis = $2^h 0^m 45^s.5$ Passing clouds star faded only Moderately good quality.

($14^s.5$ before Prediction). [NAO Prelim residual from Cor. Limb = +2".98 — bad]

Occult (6) 1969 Sept. 30 Z.C. 0537 Mag 3·8 Reappearance D. Limb P.A. 185°

Observed Reap LST $2^h 39^m 45^s.0$ (+cor Clock $2^s.0$ F) cor Obs LST = $2^h 39^m 43.0$

∴ UT Observed Reappearance = $2^h 15^m 6^s.3$ Passing Clouds: Observation rather poor.

($0^s.3$ before adhoc prediction - no correction) [N.A.O. Prelim, resid from Cor Limb +24".4 - hopeless]

Occult. (7) 1969 Sept. 30 Z.C. 0536 Mag 5·4 Reappearance D. Limb P.A 235°

Observed Reappearance LST $3^h 4^m 38^s.0$ (+cor Clock $2^s.0$ Fast) cor Obs LST = $3^h 4^m 36^s.0$

∴ U.T. Observed Reappearance = $2^h 39^m 55^s.2$ Passing Cloud: Observation Very Poor.

($1^s.2$ after prediction) [N.A.O. Preliminary Residual from corrected limb = +5".17 — v. bad]

Occult. (8) 1969 Sept. 30 Z.C. 0539 Mag 4·4 Reappearance D. Limb P.A. 265°

Observed Reappearance LST = $3^h 27^m 12^s.0$ (+cor Clock $2^s.0$ Fast) cor Obs LST = $3^h 27^m 10^s.0$

∴ U.T. Observed Reappearance = $3^h 2^m 25^s.5$ Passing Cloud: Observation Fairly Good.

($16^s.5$ before prediction) [N.A.O. Prelim Residual from Cor limb = -0".68]

Occult (9) 1969 Sept. 30 ZC 0541 Mag 4·0 Reappearance D. Limb P.A. 233°

Observed Reappearance LST = $3^h 42^m 18^s.0$ (+cor Clock $2^s.0$ Fast) cor Obs LST = $3^h 42^m 16^s.0$

∴ U.T. Observed Reappearance = $3^h 17^m 29^s.0$ Passing cloud: Observation Fairly good.

($10^s.0$ before Prediction) [N.A.O. Prelim Residual from Cor limb = +0".40]

All the above occultations were observed under difficult conditions due to rapidly passing cloud, causing fluctuations in brightness of stars. The disappearance is very likely early & the reappearances late. For all reappearances micrometer wires were set on the position of star at reappearance. The first 2 occultations (in BAA Handbook) & the last 2 were not observed: we got 5 out of 9.

1969

Oct. 3·0 (night Thursday–Friday) 0a-0 Plate Transp 7-8/10 T=54°-53° F=9

C/Kushiro-Ichinoseki 1969 b Exposure 30 min Cor UST mid Exp 20h 52m 59s.6

Drove with moving web towards P.A. 29° 46' ↘ in 10 min (2".9) Stars.

Plate centred at 18h 6m.8 +27° 47'. Thin cloud was taken because of the great transparency (thin & poor seeing) to compare state of comets tail with that on previous night. No measurement for position was made.

Coma condensed 20" diameter with little outer coma. Short faint tail 60" long in P.A. about 115°

Oct 14.8 (night of Tuesday–Wednesday) Plate 0a-0. Transp 7/10 But v. low alt. & Skyfull Twilight

C/Tago-Sato-Kosaka 1969 g Thin new comet was discovered on Oct 10·4 by the above 3 astronomers at Tokyo Observatory. To night was the first opportunity for observing it: but it was extremely low above near the sunset and moving South. It was only possible to give short exposure.

Exposure 10 min Cor UST mid Exp was 20h 15m 6s.1 T=56°-55° F=9

Intended to Drove with moving web towards PA 55° 30' ↘ in 5 min (8".2) Stars.

Plate centred at 16h 27m.6 −4° 39' (1969). The plate shows a definite image of comet. The central coma only moderately condensed about 30" diameter. The outer coma is very diffuse about 4' diameter. Intensity may at about 9.5 Guiding was difficult as only good guide star was v. faint – almost between webs. on fixed web. C/Tago-Sato-Kosaka 1969 g:-

Plate measured give: Oct 14·77958: 16h 23m 16s.61 −4° 24' 37".5 (1950)

Nine stars measured

B.D −4°4107, −3°3939, −4°4110 Ds ·222167, ·255514, ·522318

BD −4°4102, −3°3940, −4°4113 Ds ·245978, ·257573, ·496450

BD −4°4101, −3°3943, −4°4118 Ds ~~·425427,~~ ·297884, ·266689

Final mean of 3 reductions

Res ε = 2".2 δ = 1".7

Alt. = 15° 50' 40" Diff negligible

Plate measurement: Oct 15.0 C/Kirkwall 1966

Oct. 14.84952 $18^h\ 2^m\ 11^s.47$ $+27^\circ\ 9'\ 9''.2$ (1950)

Nine stars were measured:

B.D. 26°3158, 27°2944, 26°3180 : Ds = ·383335, ·441466, ·175210

BD 26°3149, 27°2941, 26°3184 : Ds = ·410958, ·298963, ·290078

BD 27°2938, 26°3168, 27°2961 : Ds = ·543062, ·170917, ·286019

Direct mean of the three reductions were adopted.

Rms $d = 2''.0$ $\delta = 2''.1$.

Occult (10) 1966 Oct 20 Z.C. 3256 Mag 6.2 Dis. 8 d. P.A 104°

Observed Dis LST $21^h\ 21^m\ 31^s.1$ (+ve Clock $0^s.25$ fast) or Obs. LST $21^h\ 21^m\ 31^s.3$

: Obs. U.T. Dis $19^h\ 35^m\ 12^s.6$ very good quality observation.

($5^s.4$ before prediction) [N.A.O. position received from Cov. limit = +0".24]

This occultation was observed in duplicate by H. H. Morgan using 4" Mag (same clock) Disappearance $19^h\ 35^m\ 12^s.9$ U.T.

[N.A.O. position received from Cov. limit = +0".14]

Plate measurement Oct. 29.8 C/Kirkwall 1966

Oct. 29.80818 $18^h\ 3^m\ 4^s.38$ $26^\circ\ 44'\ 27''.2$ (1950)

Nine Stars measured BD +26°3158, 26°3168, 26°3180 Ds ·525571, ·262936, ·211491

B.D. 27°2938, 26°3159, 26°3184 Ds ·339112, ·303649, ·357240

B.D. 26°3148, 25°2426, 27°2961 Ds ·365574, ·276142, ·358295

Direct mean of the 3 reductions were adopted.

Rms $d = 2''.1$ $\delta = 2''.2$

1969.

Oct. 15·0 (night of Tues-Wed) continued.

C Kohoutek 1969b Oa-O Plate Transp 6/10 T = 55°-54° Fq.
Exposure 30 mins. Corrected UST of Expos 21h 46m 6s·1 Motion at moment is negligible in 30 minutes — so drove with fixed worm. Plate centred at 18h 2m 54sec + 26° 48' Central condensation strong about 20" diameter Tail in PA 90° about 45" long. From the central condensation two curved streamers curve towards PA 135° and PA 180° each about 45" long & both rather narrow — obviously thrown towards PA 180° The whole suggesting a spiral arrangement. Est integrated Mag = 12·8

Oct 29·8 (night of Wednesday-Thursday)

I C/Tago-Sato-Kosaka 1969g Plate Oa-O Transp 7/10. But T was high & U.C. low altitude In view of the good transparency an attempt was made to get a further plate of this comet for position before it got too far below the equator. This was specially desirable as the comet is due to return to the northern hemisphere early next year as a fairly bright comet — and the orbit is so far poorly determined. T = 50° F11

Exposure 4 minutes. Corrected UST mid Expos = 20h 36m 58s·9.
Drove with free drive Plate centred 16h 38m·5 − 12° 16'

Owing to the short exposure, twilight & extremely low altitude no sign of comet on plate.

II C/Ikeya-Seki 1969b Oa-O Plate. Transp 6-7/10 T = 46°-44 F11
Exposure 15 mins (moon was rising) UST of mid Expos = 21h 45m 32s·9 Drove with fixed worm (motion negligible). Plate centred at 18h 4m·2 + 26° 46'
Comet image faint Central condensation 15" diameter Outer coma 30" diameter. Tail appears a short one towards PA 140° & a longer one to PA 220°. No definite Fan. Est Integ. Mag = 12·6

Plate Measurement Nov. 5.0 P/Faye 1969 a

Nov. 5.015182 $\alpha = 5^h\ 29^m\ 40^s.83$ $\delta = +10^\circ\ 30'\ 1''.7$ (1950)

Nine stars measured BD +10°803, 10°806, 11°854 Ds: ·185798, ·682875, ·131328

B.D +10°798, 11°837, 9°892 Ds: ·333807, ·441284, ·224909

BD +10°795, 11°853, 9°876 Ds: ·363572, ·424494, ·211935

Direct mean of the 3 reductions. Rms $\alpha = 1''.3$ $\delta = 1''.2$

Plate Measurement Nov. 26.7 C/Kharitch.

Nine Stars measured: BD +27°2994, 27°3000, 27°3001 Ds: ·482791, ·430202, ·421519

B.D 28°2971, 27°2997, 27°3005 Ds: ·251941, ·311914, ·436146

BD 28°2970, 27°2995, 27°3002 Ds: ·140555, ·138943, ·670500

Nov. 26.761886 $18^h\ 17^m\ 22^s.59$ $+27^\circ\ 41'\ 55''.2$ (1950)

Direct mean of the 3 reductions adopted.

Rms $\alpha = 2''.0$ $\delta = 2''.9$

1969

Nov. 5.0 (night of Tuesday-Wednesday)

P/Faye 1969 a This comet was recovered by Elizabeth Roemer on May 17 quite close to its predicted position at May 18 – about 1 mag fainter than predicted. I stupidly failed to try to look for this comet sooner expecting its magnitude to continue 1 mag fainter than predicted: so that by Nov 5 it should still be about mag 13.6 – when I decided to have a go.

Exposure 10 minutes Plate Oa-O Transp 7/10 T=37° F 14.5

Gr LST mid Expn = $3^h 8^m 6^s.2$. As comet was moving at 6".4 in 10 mins towards PA 62° 30' ↙ I was able to drive with fixed wch. Plate was centred at $5^h 4^m 30^s.4$ +10° 40'

The comet image is faint on the plate: diffuse coma 30" diameter, with near-stellar central condensation – not very dense. Integrated Mag est at 11.5

Nov 26.7 (night of Wednesday-Thursday)

C/Kohoutek 1969 b Oa-O Plate Transp 6-7/10 near-full moon rising T=32°.5 F 1.5.

Exposure 20 minutes. Gr LST mid Expsure = $22^h 29^m 4^s.4$. Drove with moving wch towards PA 25° ↗ in 10 min (4".5) steps. Plate centred at $18^h 18^m.0$ +27° 42' (1969.7) The comet is rather faint: Central coma 30" highly hazy moderately concentrated – no outer coma. Tail about 60' in PA 80°

Est Integ Mag = 12.5

Plate measurement Nov. 29·8 C/Kohoutek

Nov.29·75440 $\alpha = 18^h 19^m 45^s.84$ $\delta = +27° 58' 30''.6$ (1950)

Nine stars were measured BD 27°3001, 27°3005, 28°2985 Ds: ·173953, ·300194, ·525853

B.D 28°2978, 27°3002, 28° 2993 Ds: ·151166, ·465779, ·383056

BD 27°3000, 28°2979, 27°3017 Ds: ·360011, ·243454, ·396533

Range $\alpha = 0''.4$ $\delta = 2''.2$

Plate measurement Dec 4·75 C Kohoutek 1966.

Dec.4·75108 $\alpha = 18^h 24^m 4^s.58$ $\delta = +28° 31' 8''.8$ (1950)

Nine stars were measured, but only six were finally used:

B.D. 29°3253, 28°2993, 28°3004 Ds: ·131168, ·398458, ·470375

used → B.D 29°3248, 28°2985, 28°3011 Ds: ~~·398458~~ ·228728, ·306856, ·464416

discarded → BD 29°3252, 27° 3017, 28°3003 Ds: ~~·470375~~ ·201110, ·342320, ·456572

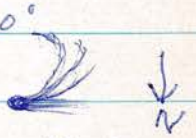
Range over the 2 reductions used $\alpha = 0''.1$ $\delta = 0''.1$

over all 3 reductions including the discarded one $\alpha = 2''.4$ $\delta = 0''.1$

1964.

Nov. 29.8 (night of Saturday-Sunday) Oa-0 Plate Transp 6-7/10 T=30°-30° F=16
C/Kohoutek 1964 6. Exposure 20 minutes Gr LST mid Expt 22h 30m 6s.6
Drove with moving worb towards PA 28°45 ↖ in 10 min (4'.5) steps.
Plate centred at 18h 21m.5 +28° 9' (1964)

The comet image is rather faint & is partially obscured by a star almost on top of it. The coma fairly concentrated & about 30" diameter a short tail extends to PA 90 extending 60"+ (cut off by star); there are also two or? three very fine curved streamers curving up towards PA 180° and up to 120" long. The appearance is similar to that of Oct. 15 — again suggesting a shell structure. Est integrated Mag 12.4



Dec. 4.75 (night of Thursday-Friday) Oa-0 Plate Transp 6-7/10 T=31°-30° F16.
C/Kohoutek 1964 6. Seeing v. v. bad.
Exposure 20 mins Gr LST mid Exposure = 22h 45m 2s.2 Drove with moving worb towards PA 31°.5 ↖ in 10 min (5'.9) steps. Plate was centred at 18h 24m 45s + 28° 32'. Central condensation 20" diameter, outer coma about 40" diameter. Short tail 60" long PA 90 — vague diffuse middle of a broad diffuse fan extending from about PA 40° — PA 120° — the fuzziness & lack of detail in tail probably due to extremely bad seeing. The main part of the fan tail lies between two streamers: the brighter 2' long PA 110° & slightly shorter one in PA 70°. Est integrated Mag = 12.1

1964 Dec. 9. Polar Sequence Plate centred on Pole Star.

Oa – O plate.

Ten Magnitude Scale

5 Exposures of varying length were given, moving the plate slightly between exposures

Exh (1)	Duration 9 mins 0 secs.	LST	$1^h 27^m 1^s$ – $1^h 36^m 1^s$
(2)	3 min 0 sec.		$1^h 37^m 1^s$ – $1^h 40^m 1^s$
(3)	1 min 0 sec		$1^h 41^m 1^s$ – $1^h 42^s 1^s$
(4)	20 secs.		$1^h 43^m 1^s$ – $1^h 43^m 21^s$
(5)	7 secs.		$1^h 44^h 1^s$ – $1^h 44^m 8^s$

1964

Occultation (11) 1964

Dec. 13. Z.C. 3171 Mag 3.8 Disappearance D.L. P.A. 10°

Observed Dis L.S.T. $23^h\ 33^m\ 42^s.2$ R.L.W. 23 33 42.5 R.H. South (+ cor $9^s.3$ Clock Fast)

Cor. Obs. Dis L.S.T. $23^h\ 33^m\ 32^s.9$ R.L.W. $23^h\ 33^m\ 33^s.2$ R.H. South

∴ U.T. Obs. Dis $18^h\ 14^m\ 33^s.4$ R.L.W. $18^h\ 14^m\ 33^s.7$ R.H. South

(3.4 sec after Pred.) (good quality Duration) ($3^s.7$ after Pred)

[Prelim Residuals from Cor. Lun = +0".20 R.L.W. = +0".12 R.H.S — N.A.O]

Occultation (12) 1964

Dec. 14 Z.C. 3310 Mag 6.4 Disappearance D.L. P.A. 17°

Observed Dis L.S.T. $22^h\ 11^m\ 59^s.0$ (+ cor 8.95 Clock Fast)

Observed Cor. L.S.T. $22\ 11^m\ 50^s.15$

∴ Observed Dis U.T. $16^h\ 49^m\ 8^s.5$ ($3^s.5$ after Pred.) (only moderately good quality: owing to silly slip in calculating Pred Time of Disappearance & making it 1m 30 sec too late, I was not expecting Dis. so soon & was taken unawares!)

[Prelim Residual from Cor. Lun. = −0".31 N.A.O]

1964 Summary of Observations during the Year.

Plate Measurement C/Kohoutek

Jan 4.75657 $19^h\ 1^m\ 7^s.99$ $+34°\ 52'\ 3''.4$ (1950).

Nine stars were measured and reduced but only 3 stars (one reduction) was used, as the other images were poor – partly due to plate being cons. off centre from comet.

Used → B.D. 34° 3399, 34° 3401, 34° 3409 Ds = ·071088, ·858846, ·070066

→ BD 34° 3388, 34° 3403, 34° 3410 Ds = ·503319, ·214508, ·282173

discarded → BD 34° 3396, 35° 3456, 34° 3412 Ds = ·248847, ·361028, ·390126

Total Range (3 reductions) $\alpha = 3''.9$ $\delta = 2''.4$

(The adopted value was in $\alpha = 2''.2$, in $\delta = 1''.3$ from the mean of the 3 reductions).

1970.

Jan 4.75 (night of Sunday–Monday) Oa-0 plate Transp 5/10 some high cloud.

C/Kohoutek 1969 b. Exposure 20 minutes. corr LST mid Exposure = 24h 55m 10.4s

Driven with moving web towards PA 43°45' in 10 min (8".1) steps.

Plate centred at 19h 1m 35s + 34° 54' (1970)

The plate is not quite perfectly focussed & the driving is rather poor.

The image of the comet is faint. Central condensation 20" fairly strong — there is only the faintest suggestion of an outer coma. There is also a suggestion of a very faint tail towards P.A. 110° & 140° (two v. faint streamers). The comet appears definitely fainter than when last observed (Dec 4) and Integ. Mag est at 12.5.

Jan 24.75 (night of Saturday–Sunday). This was the first opportunity here for observing C/Tago-Sato-Kosaka since last seen before going too far South on Oct 14.8. It is now beginning to come north within reach of this latitude. It was in perihelion on Dec 21 but is still predicted to be around mag 3.6 — about 1 mag (practically) fainter than that at perihelion.

C/Tago-Sato-Kosaka 1969 g Oa-0 plate. Very low altitude near sunset and a great deal of passing cloud.

We only managed to get one short exposure between clouds. R.H. South guided.

Exposure 1 min. corr LST mid Exposure 4h 43m 59.7s Driven ē fixed web.

Plate centred at 1h 2m 40s − 1° 30'.5. The sky clouded over again & no gaps were large enough to be worth using.

Very few stars are visible on the plate; but the comet image is strong near centre. Outer coma about 2'.5 diameter gradually condensing towards centre. Despite short exposure a suggestion of a tail towards PA 340°.

Plate not worth measuring. Integrated mag est ± 4.0

1970.

Jan 25·75 (night Sunday-Monday) 1.

C/Tago-Sato-Kosaka 1969 g. The weather continues hopelessly unsettled — a tremendous lot of cloud with only few & mainly very short gaps occurring unpredictably. We managed to get 2 exposures — one very short and another of about 10 minutes (but even that was greatly reduced by passing cloud. The short exposure was not good enough for precise measurement; and the longer exposure not so long as we hoped for & not long enough to show very much in the way of tail structure.

Exposure I 1 minute Oc-O Haze Passing cloud, Poor Transparency.

Co L.S.T. mid Exposure = $2^h 44^m 31^s.3$. Stars fixed wch. Plate centred at $1^h 11^m 36^s + 2° 0'$. Image of comet in clear Central Coma 30" diameter & Outer coma 2'·5 diameter. Circular, no sign of tail.

Exposure II 10 minutes Oc-O Haze. Passing cloud & poor transparency.

Co LST mid Exposure = $3^h 18^m 19^s.7$ Stars with moving wch towards PA 58°40' in 1 minute (10"·1) steps. Plate centred at $1^h 11^m 36^s + 2° 0'$ (1970)

The star trails are broken & crudely stopped due to passing cloud

The inner coma strongly condensed about 2'·5 diameter. Outer coma traced to about 6' diameter. Tail about 1° long in PA 75°. Faint & very diffuse but sharply defined - but extent narrows. No definite structure.

1970

Jan 26·75 (night of Monday–Tuesday) Our bad luck with the weather continues. Continuous rainfall, passing cloud with short unpredictable gaps. In the event of selecting a gap (then too very rapid motion > 1 min. etc driving steps) the RA was erroneously set — so the comet is right on edge of plate — (also in the process of changing the position of the orbs part of the exposure seems to have been made moving along one declination orb & part along the other declination orb!)

C/Tago-Sato-Kosaka 1969 g Oa-O plate Transp 6/10 but much interruption due to passing cloud. Eptom = 23 min (17 Gm) Cor LST mid Expr = 2h 52m 29s·5

Drove with moving orb towards PA 58°·5 ↗ a 1 min (9"·5) steps.

Plate mostly centred: Comet (near edge of blank) was near 1h 29m 51s + 5° 33'

The heavily condensed inner coma was 2'·5 diameter, the coma to about 7'·5 diameter. Tail about 1° 30' long in P.A 75° — Tail narrow at root about 1'·5 wide spreading out into a narrow diffuse fan. (Tail extends beyond edge of plate)

Feb 4·75 (night of Wednesday–Thursday) This was the first night with a clear interval since this comet came north on Jan 17.

C/Tago-Sato-Kosaka 1969 g

Two exposures were given on short 3 min & one long 35 min: Oa-O Transp 6/10

1) Expr 1) Expr. 3 min was LST mid Expr = 3h 10m 29s·5. Drove with fixed orb.

Plate centred at 2h 16m 50s + 26° 28' Comet image strong - definitely trailed.

Orbs were about 5' diameter faint tail towards PA 85° about 10' long.

2) Expr. 2) Expr 35 min was LST mid Expr 4h 4m 29s·5. Oa-O. Transp 6-7/10 T 37°·35 F 14

Drove towards PA 54° ↗ with moving orb in 1 minute (4"·7) steps. Plate

centred at 2h 16m 50s + 26° 28'. The long exposure shows heavily condensed inner coma about 4' diameter, and an outer coma & faint transverse diameter of about 10'. The outer coma

Plate Measurement Minor Planet (for identification) (Plate I 3 min. exposure)

Feb. 4·76564 $\alpha = 2^h\ 10^m\ 45^s\cdot61$ $\delta = +25^\circ\ 30'\ 54''\cdot8$ (1950)

Six stars were measured and the direct mean of the 2 reductions taken as result.

B.D. $+25^\circ 363$, $24^\circ 324$, $25^\circ 377$ $\Delta s = \cdot379266$, $\cdot418390$, $\cdot202345$

B.D. $+25^\circ 358$, $24^\circ 319$, $25^\circ 378$ $\Delta s = \cdot282321$, $\cdot424241$, $\cdot293437$

Res. $\alpha = 2''\cdot2$, $\delta = 0''\cdot7$

1970

Feb. 4.75 (cont.) Photo to C/Tapo Sato Ranch + Minor Planet ? Which shows some indication of being "hooded", symmetrically with respect to direction of tail. The main tail is a very diffuse streamer towards P.A 80° + 2°.5 long — it appears to be double in part of its length. A shorter + more diffuse tail is about 0°.5 long centred round PA 130°. There is no sharp detail in either the head or the tail of the comet.

? Minor Planet. During the examination of this plate it was noticed that 3 star-trails 1¾ S of the comet — + just to the right of plate centre — were definitely not quite parallel to the others. The star trails are long (about 2½); and it was clear that the central trail must be of a moving minor planet (there was no hyphen about it, which excluded another comet). It was then found possible to locate the object on the 1st of the 2 plates (3 mins exposure) which had been taken about 54 minutes earlier. From this an approximate daily motion was deduced. (As this discovery was not made till the following morning it could not be further confirmed the same night.) The short exposures were measured for precise position

Feb. 5 ? Minor Planet. Orbit and Milham + Dan Taylor (H.M. Nautical Alm. Office) on the position, daily motion + approximate magnitude were set out to identify which one it was

Feb. 5.75 (night of Thursday-Friday). The sky was overcast, but there were very occasional + transient gaps. So the telescope was set on the indicated position + I waited for a chance to expose. We managed to expose one plate but only for a few seconds before it clouded up. GST Exp. about 3h 24m 0s. Centred on 2h 14m 50s + 25° 38'.0. Owing to short exposure Minor Planet was at extreme limit of visibility on plate + could not be used for definite measure.

Plate Measurement of ? Minor Planet (Plate II)

Fb. 6·80104 $\alpha = 2^h 13^m 25^s.07$ $\delta = +25^\circ 29' 17''.2$ (1950.0)

Six stars were measured

B.D +25°363, +24°330, +25°377 Ds = ·159697, ·231089, ·609215

B.D +24°324, +26°378, +25°378 Ds = ·470890, ·147643, ·381462

The direct mean of the 2 reductions were taken as the result.

Range $\alpha = 1^s.9$ $\delta = 1''.7$

Plate measurement of ? Minor Planet

Fb 7-78585 $\alpha = 2^h 14^m 43^s.11$ $\delta = +25^\circ 28' 36''.4$ (1950)

Five stars were measured, one of which were used in both reductions

BD +24°324, +25°377, +25°378 Ds: ·215569, ·270416, ·514015

BD +24°325, +25°377, +24°335 Ds: ·071557, ·503537, ·324905

a straight mean of the 2 reductions were taken as final result.

Range $\alpha = 3^s.0$ $\delta = 1''.3$

'47.

Feb 6 (Second Plate for identification of minor planet) Passing clouds as previously but longer gaps and were able to get 2 good exposures on ? minor planet.

Feb 6-75 (night of Friday-Saturday) Oa-Oplate Transp 6/10 T=35°-33° F=15

Exposure I 6 mins. On LST mid Exp. 3h 28m 0s.1

Exposure II 3 mins on LST mid Exp. 4h 9m 30s.1

Both exposures were driven with fixed worm and plate centred on

2h 14m 0s +25° 38'.5

The ? minor planet gives a good image on both plates & has displacement from the position occupied on Feb 4-75. The shorter exposure Plate II was measured for precise position.

The comet is v. faint on both plates towards the North following corner of plate.

Feb 7-75 (night of Saturday-Sunday) Third plate for identification of minor planet.

Minor Planet Exposure 7 min Passing cloud 2 min, 5 min clear. Oa Oplate Transp 4-5/10

On LST mid Exposure = 3h 51m 30s.3. Drove with fixed worm Centre 2h 14.0 +25° 38'

Again we were lucky: much passing cloud from 6 exposure & clearing completely soon after it.

The image of the minor planet is good.

The photographic magnitude of this object on all plates taken was estimated at 11.0 — about .5 mag fainter than BD+25° 378

I sent these 3 positions to Marsden: none of the published ephemerides agreed with the object — so he calculated an approx orbit from my 3 positions & finally identified it by the elements. It turned out to be Interamnia No. 704 & had been in opposition on Oct 27, 1964

Occultation 1970 (1)

1970 Feb. 15 2.C.885 Mag 5.6 Diffraction D.L. P.A. 132°.

Observed disappearance LST $6^h 59^m 22^s.5$ + corr (clock $1^s.5$ fast.)

$\equiv$ LST $6^h 59^m 24^s.0$

∴ Observed U.T. of disappearance = $21^h 27^m 33^s.1$ good quality observation

($2^s.9$ before predicted U.T.) Preliminary residual from Cox limb (N.P.O.) = $+1''.23$

In spite of my having classed this as "good quality" the N.A.O. residual is surprisingly large!

1970.

Feb. 26 (night of Wednesday–Thursday) Two plates exposed (1) C/Kohoutek (2) C/Tago-Sato-Kazuha.

(1) C/Kohoutek (1969G) Exposure 22·5 min Oa-0. Transp 7/10 T 34°-33° F 15

Cor ΔT mid-expose: 5h 41m 18s·0. Drove with moving web towards P.A. 39° 15' ↖ in 2½ minute (6·0) steps. Plate centred at $\alpha = 21^h\ 35^m\cdot 9$ $\delta = +60°\ 58'$

Plate shows v. strong image of comet: Heavily condensed inner coma 30" diameter with little or no outer coma. The tail is in form of a wide diffuse fan extending between PA 290° & 10°. The strongest tail is a wide stream in P.A 230°, 2' long. The edges of the fan are regularly condensed to form 2 bordering streamers about P.A 290° & PA 10° about 1' long. Est Integrated Photo mag = 12·0

(2) C/Tago-Sato-Kazuha 1969 g. Oa-0 Plate Transp 7/10 T 33°-32° F 15.

Exposure 20 mins. Mid cor LST Expn = 6h 54m 3s. Drove with moving web towards PA 37°23' ↖ in 5 minute (7"·8) steps.

Plate Centred at 3h 32m·5 +43° 0'

The image is strong: Inner coma about 45" diameter heavily condensed. Outer coma about 2'·5 diameter. There is a very diffuse wide fan-shaped tail with an angle of about 80° centred about PA 130° and extending widely for about 7'.

March 3·0 (night of Tuesday–Tuesday) Oa-0 Plate Transp 6-7/10 T=34° F 15

C/Tago-Sato-Kazuha 1969 g Exposure 20 mins. Mid cor LST Expn. 5h 48m 1s·4

Drove with moving web towards P.A 33°·5 ↖ in 5 minute (6"·8) steps. Centred on 3h 45s·1 +44° 38'

Comet image shows bright coma about 30" diameter fairly heavily condensed with outer coma to about 3' diameter. Coma otherwise circular – no suggestion of tail.

1970.

Mar 6·0 (night of Thursday - Friday) Two plates were exposed on the comet

C/Tago Sato - Kanchu 1969 g Oa - O plates.

I Exposure 20 mins (R.L.W.) Transp 6-7/10 T 32°-30° F. 16

in LST mid exposure 6h 33m 59s.3.

II Exposure 20 min (H. Morgan) Transp 7/10 T = 30°-29° F 16.

in LST mid exposure 7h 19m 59s.3

Both plates driven with moving unit towards PA 31°20' ↖ in 5 minutes (6".3) steps; and centred on 3h 53m.0 + 45° 30'.5 (1970)

The comet image is strong on both plates and differs from one another only in minor respects.

Plate I Inner coma fairly heavily condensed 30" diameter. Outer coma is about 2'.5 in diameter but is diffusely elongated towards its f side with a broad radial streamer like condensation extending for about 1' in P.A 90°

Plate II Inner coma fairly heavily condensed 30" diameter. Outer coma is about 2'.5 in diameter and as in plate I is diffusely elongated on its f side; but there is now no sign of the radial concentration towards P.A 90° instead there is now a fine linear spike in P.A 350° 1'.5 long.

Mar 7.0 (night of Friday - Saturday) Oa - O plates Transp 6/10 T 35°-32° F 15

C/Tago - Sato - Kanaka 1969 g Exposure 20 min Mid on LST Exp = 6h 16m 59s.5

drove with moving unit towards P A 30°40' ↖ in 5 min (6".2) steps.

Plate centred at 3h 55m.2 + 45° 43'

The comet image is strong; but is unfortunately superimposed on 3 if not 4 faint stars. One can only say the appearances are essentially same as last night: inner coma 30" diameter, outer coma 2'.5 diameter & elongated on f side.

1970

March 28. C/Bennett 1969 i, discovered Dec 1969 in southern hemisphere; due to reach perihelion 0.54 A.U. around March 20 and achieve first magnitude brightness. Up till end of March 1970 would only be observed in S. hemisphere. The first possible date for drawing it at Worthing was March 28 when it would be just above N. Eastern horizon just before dawn. Unfortunately on that date it would be out of reach of 6" being behind a tree

Visual observation only: a fleeting glimpse of the comet was got through field glasses & the branches of a tree. It appeared about magnitude 1. No other observation possible.

The early mornings of March 29, 30 & 31 were completely overcast.

April 1 160 C/Bennett 1969 i Kodak Oa-O plate (Whole Plate). Trans op 7/10 but thin hazy cloud night of March 30-Apr 1 (night of Tues-Wednesday) T=33°-32° E 14.
Comet v. bright (est. about mag 1.0) Definite twilight Considerable slightly curved tail N.E.
Exposure 7 mins. Cor Mid - L.S.T. = 16h 16m 31s.4 approx U.T. April 1st 3h 50m
Drove with moving wel on Comet's nucleus (centred in micrometer web-square)
Motion in 1 minute = 7'.2 towards P.A 76°24'. Approx Plate Centre = 22h 22m.2 +19°45'
Comet was fairly low altitude R.L.W. drove — assisted by Mark Ellington.

Observations from here written up by D. G. Buczynski FRAS of the Calder Brow Observatory in Lancaster

C/Bennett 1969 I

1970 April 2.17 (At 2.15574) (clock $0^s.3$ slow) + density strip exposure 5 mins

α $22^h.25^m.10^s$ $\delta = +22° 27'.5$ (1970)

PA 75°.12' circle :21° 28'

8 min = 2.148 revs = 55".3

in ½ : 1 min = 6".9 steps

Exposure 21 mins R.L.W. driven on nucleus T = 28 f 17

Transparency 4/10 LST. $16^h.4^m.3^s$ - $16^h.25^m.3^s$ exposure = U.T. $3^h.44^m.16^s$

C/Bennett 1969 I

1970 April 4.17 (4.16042) density strip exposed 5 mins.

α $22^h.31^m 45^s$ δ 27°. 32'.5 (1970)

P.A 72°.40 circle 24°.0

8 mins = 51".2 = 1.99 revs

(in ½ steps = 1 min - 6".4 steps

Partly cloudy Transparency 5-6/10

Exposure 40 mins M.J.H. drove on nucleus

L.S.T. 16.9.12 - 16.49.12 T = 36/35 + 14

Exposure 15^h 51.0^s U.T.

C/ BENNETT 1969 I

A70 APRIL 7.17 α 22ʰ 42ᵐ 45ˢ + 38° 15' 0 (1970)

P.A. 68°.42 Circle 28°.

8 min motion = 44".5 = 1.727 revs

i.e. ½ = 1 min = 5°.6 steps GUIDE STAR 24 min P. 3½° N.

① EXPOSED 33 Mins U.S.T. 15.10.1 – 15.43.1 TRANSPARENCY 7-8/10

② " 25 mins U.S.T. 16.22.1 – 16.47.1 TEMP 33° - 31°

APRIL 7.10882 MTH ORNG BOTH EXPOSURES

APRIL 7.15591 "

EXPOSURE 2 3ʰ 44ᵐ · 30ˢ.6 U.T. APRIL 7.156

C/ BENNETT 1969 I

APRIL 1970 APRIL 9.17 EXPOSURE ① AT 9.11548

② AT 9.15708

α 22.50.50 + 38° 13 (1970)

P.A. 66°.12 CIRCLE 30°.28

16 min motion = 80°.6 = 3.130 revs

GUIDE STAR 24ʰ.5 P 1°.5N of comet

22ʰ 26ᵐ 30ˢ + 39°.40

8 mins motion = 40.3 = 1.565 revs

i.e. ½ = 1 min = 5°.0 steps

Ex ① Transparency ± 4/10 low altitude & haze

Ex ② " ± 6/10 more or less out of shape

Beginning Twilight.

Exposure ① 22 mins G.S.T. 15.33.1 - 15.55.1

② 18 mins L.S.T. 16.35.1 - 16.53.1

Temp: 28-27 f-16

Ex ② April 9.15p 3h. 36m 9s U.T.

C/Bennett 1969 I

1970 April 10.17 (Ap 10.08920)

& α 22.55.6 +39°54'.0 (1970)

P.A. 64°.45' Circle: 32°.0

16 min motion = 3.00 Rev in 1/8 = 2 Mins = 9".6 steps

Exposure 20 mins Temp 30° f/6

GST 15. 0.1 - 15. 20.1 Rev. Transparency 4-6/10

C/Bennett 1969 I

April 1970 Ap 11.17 (Ap 11.13426 Guide Star

α 22.59.25 δ +41°33'.7 (1970) 16 Mins f

P.A. 64°.28 Circle reading 32°.12' 10' N

16 mins motion = 72".10 = 2.80 Revs in 2 mins 1/8 = 9".0 steps

EXPOSURE 22m L.S.T. 16.8.1 - 16.30.1 OBS H MORGAN
TRANSPARENCY VVG 8/10 Temp = 33° - 33° f = 15

C/BENNETT 1969 I
1970 APRIL 14.17 (AP 14.12400)
α 23.12.55 + 45°58.0 (1970)
PA 59°.57 Circle 37°.13'
16 mins motion = 62".6 = 2.43 revs in 1/8 = 2 mins = 7'.83 steps
GUIDE STAR 20m P 1°.25 N
EXPOSURE 22 mins L.S.T. 16.5.1 - 16.27.1
Temp = 37° f = 14

Suddenly hazed up 2 mins after starting. G.S. gradually difficult
Sometimes invisible but occasionally bright TRANSPARENCY V± /10