

MARS SECTION

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SECTION REPORT—MARS IN 1967

The apparition of 1967 was the fourth and last of the present series of aphelic apparitions of the planet. The diameter of the planet at opposition was 15".6, only slightly greater than that of the previous apparition of 1965. The northern hemisphere was turned towards the Earth, the tilt of the north pole being 21° at opposition. The northern features of Mars were thus well presented for observation.

The names of members who contributed observations with particulars of their location and telescopes used are as follows:

<i>Observer</i>	<i>Location</i>	<i>Instruments</i>
D. Allen	Cambridge	12-inch (30 cm) O.G.
A. Appleyard	Sheffield	7½-inch (19 cm) Spec.
J. H. Botham	Johannesburg	8-inch (20 cm) Spec.
W. B. Caunter	Billinghurst	6-inch (15 cm) O.G.
M. Cohen	Cambridge	12-inch (30 cm) O.G.
E. H. Collinson	Ipswich	10-inch (25 cm) Spec.
E. L. Cross	Preston	9-inch (22 cm) Spec.
H. E. Dall	Luton	15½-inch (39 cm) Cassegrain
D. G. Daniels	Mill Hill	18-inch (45 cm) O.G.
K. J. Delano	New Bedford, Mass., U.S.A.	12½-inch (31 cm) Cassegrain
W. E. Fox	Newark	10-inch (25 cm) Spec.
P. A. W. Fulford	E. Dulwich	3-inch (8 cm) O.G.
M. J. Gainford	Nuneaton	8½-inch (21 cm) Spec.
A. W. Heath	Long Eaton	12-inch (30 cm) Spec.
M. V. Jones	Maryborough, Queensland	8-inch (20 cm) Spec.
R. MacDonald	Edinburgh	6-inch (15 cm) Spec.
T. L. MacDonald	Mill Hill	18-inch (45 cm) Spec.
H. McKeating	Edinburgh	6-inch (15 cm) Spec.
R. W. Middleton	Colchester	4-inch (10 cm) O.G.
P. A. Moore	Armagh	10-inch (25 cm) O.G.
J. B. Murray	Cambridge	12-inch (30 cm) O.G.
J. Olivarez	Mission, Texas, U.S.A.	12½-inch (31 cm) Spec.
M. F. & A. R. Pace	Stoke-on-Trent	14-inch (35 cm) Spec.
C. Papadopoulos	Johannesburg	12-inch (30 cm) Cassegrain
R. Paterson	Oxford	10¼-inch (25 cm) Spec.
T. Pearce	Mill Hill	18-inch (45 cm) O.G.
J. R. Pressman	Ruddington	6-inch (15 cm) O.G.
J. H. Robinson	Teignmouth	10½-inch (26 cm) Spec.
K. Simmons	Jacksonville, U.S.A.	26-inch (65 cm) O.G.
H. R. Soper	Manchester	12-inch (30 cm) Cassegrain
R. de Terwangne	Antwerp	170 mm O.G.
A. W. Wake	Teignmouth	15½-inch (39 cm) Spec.
M. R. Whippey	Northolt	6-inch (15 cm) Spec.

Observations were made with a view to detecting changes in the shape and intensity of the surface features and the presence of clouds.

The principal features of the planet as observed during this apparition are described below under the three regions as in previous reports.

REGION I: ω 250°–10°

During the first half of the apparition all observers remarked on the brilliance of Hellas which was often noted as being brighter than the North Polar Cap. Its unusual brilliance was probably due to a covering of cloud. (See figures 1, 2 and 3.)

Syrtis Major was, as usual, the most conspicuous feature of this region. Between June 3 and 7 a large elongated white cloud obscured Iapigia and was well observed by Botham and Gainsford. (See figures 4, 5 and 6.)

The Nepenthes-Thoth curve was rather narrow and faint and not so conspicuous as is shown on the I.A.U. map. Casius, Nilosyrtis and Boreosyrtis were shown on most drawings as somewhat indefinite shadings without much detail. Ismenius Lacus was fairly conspicuous and, according to Gainsford, varied in intensity. It was not so conspicuous as shown on the I.A.U. map. Protonilus and Deuteronilus were seen by most observers as rather faint shadings; nevertheless, they were both clearly shown on a beautiful photograph by Dall taken on April 29.

Sinus Sabaeus and Sinus Meridiani were dark and of normal appearance. Sinus Meridiani was much darker than Sinus Sabaeus on Dall's photograph of April 29.

REGION II: ω 10°–130°

Aurorae Sinus, Solis Lacus and Aonius Sinus were too near the south limb and too foreshortened to be satisfactorily observed. The appearance of Marearitifera Sinus was normal. Oxia Palus was generally faint but Botham noted it as conspicuous on June 27. Mare Acidalium dominated this region of the planet and appeared as shown on the I.A.U. map. Achillis Pons, the gap between Mare Acidalium and Niliacus Lacus, was well seen by Fox on April 23 and by Allen on May 29. (See figures 8 and 9.)

Nilokeras and Lunae Lacus were noted as being fairly conspicuous in good seeing conditions. Allen described Lunae Lacus as large and fuzzy in mid-April but more clearly defined on May 21. Tempe was bright when near the limb.

REGION III: ω 130°–250°

Although close to the south limb Mare Sirenum and M. Cimmerium were conspicuous but owing to foreshortening little detail was seen in these maria. Amazonis was bright and full of faint shadings when observed in good seeing. This region appeared very bright on photographs by Dall on May 7 and 10.

Trivium Charontis and Cerberus were well seen but Phlegra and Propontis were indistinct. Only faint shadings were seen in the Aethiopia region.

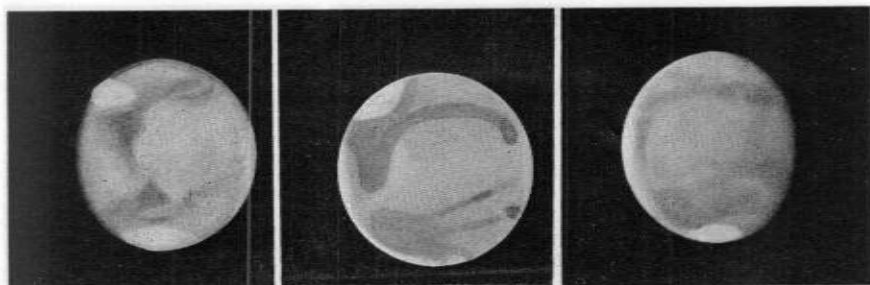


FIGURE 1 (*left*). 1967 February 20d. 3h. 30m. $\omega=302^\circ$. 12-inch (30 cm) O.G. D. Allen. FIGURE 2 (*centre*). 1967 May 8d. 2h. 30m. $\omega=287^\circ$. 17-inch (44 cm) Spec. J. Olivarez. FIGURE 3 (*right*). 1967 June 6d. 21h. 50m. $\omega=341^\circ$. 12-inch (30 cm) O.G. J. Murray.

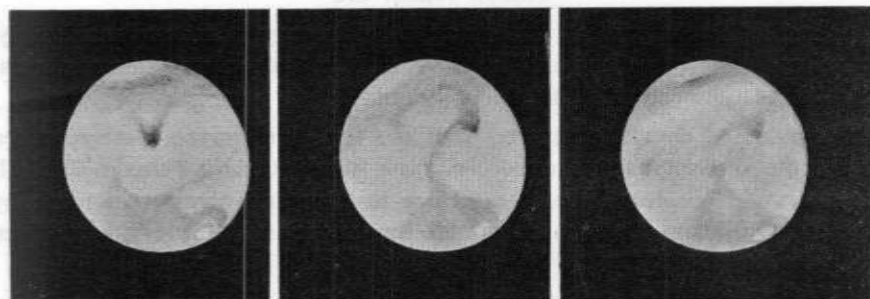


FIGURE 4 (*left*). 1967 June 3d. 17h. 15m. $\omega=302^\circ$. 8-inch (20 cm) Spec. J. H. Botham. FIGURE 5 (*centre*). 1967 June 4d. 16h. 0m. $\omega=274^\circ$. 8-inch (20 cm) Spec. J. H. Botham. FIGURE 6 (*right*). 1967 June 7d. 17h. 30m. $\omega=269^\circ$. 8-inch (20 cm) Spec. J. H. Botham.

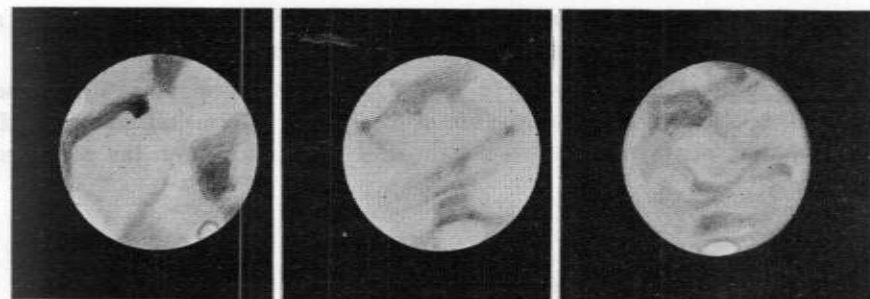


FIGURE 7 (*left*). 1967 April 23d. 20h. 35m. $\omega=358^\circ$. 8½-inch (21 cm) Spec. M. J. Gainsford. FIGURE 8 (*centre*). 1967 April 23d. 23h. 0m. $\omega=33^\circ$. 10-inch (25 cm) Spec. W. E. Fox. FIGURE 9 (*right*). 1967 May 29d. 21h. 50m. $\omega=55^\circ$. 12-inch (30 cm) O.G. D. Allen.

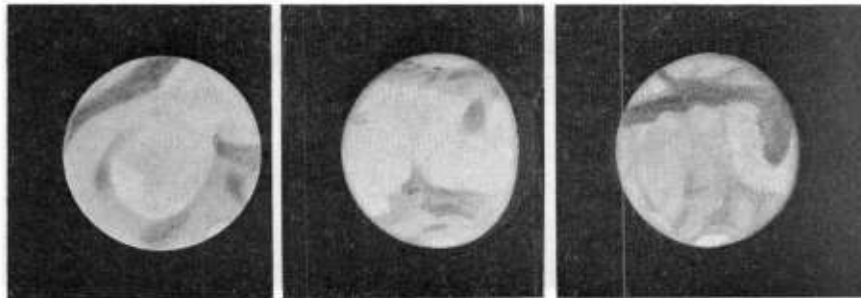


FIGURE 10 (*left*). 1967 May 9d. 21h. 10m. $\omega=226^\circ$. 8½-inch (21 cm) Spec. M. J. Gainsford. FIGURE 11 (*centre*). 1967 June 14d. 22h. 11m. $\omega=272^\circ$. 8½-inch (21 cm) O.G. M. Cohen. FIGURE 12 (*right*). 1967 June 12d. 19h. 50m. $\omega=256^\circ$. 12-inch (30 cm) O.G. D. Allen.

NORTH POLAR CAP

As in the 1965 apparition the cap appeared to vary in extent considerably, sometimes being very small and bright as usual in the northern summer but at other times more extensive and dull, no doubt due to polar haze.

A number of clouds, obscuring haze and limb brightnesses were recorded during the apparition. A summary of these observations is given in Table I. Estimates of the intensity of the surface features and areas were made by Appleyard, Botham, Delano, Heath and Terwangne and their results are given in Table II.

A. W. Heath made observations using the following colour filters: Dufay Tricolour red, green and blue, Ilford Micro-blue and Wratten 47b (blue). The red filter produced a slight increase in density and contrast in the dark areas. The green filter showed the dark areas about one point fainter than as seen with no filter. Hellas and the polar cap both appeared brilliant with the green filter. Using the blue filters the dark areas were very weak and diffused or invisible. On April 25d. 21h. 0m. to 21h. 15m. U.T. the dark areas in the region of $\omega 6^\circ$ were well seen with the Ilford Micro-blue filter indicating a "blue clearing" in the Martian atmosphere. (See figure 13.)

The planet was photographed by Dall, Daniels, Papadopoulos, Pierce and Soper. Daniels and Pierce had the use of the 18-inch (45 cm) refractor at Mill Hill and their photographs show a great deal of detail in both the dark and light areas.

TABLE I
OBSERVATIONS OF CLOUDS

The following observations of clouds and haze were made during the apparition:

<i>Date and time</i>	<i>Position and description</i>	<i>Observers</i>
1966 Dec. 16d. 9h. 10m.	White cloud suspected over Aeria.	Delano

<i>Date and time</i>	<i>Position and description</i>	<i>Observers</i>
1967		
Jan. 3d. 9h. 15m.	Bright limb cloud in M. Cimmerium region.	Delano
11d. 9h. 10m.	Bright limb cloud = north polar cap in M. Sirenum region.	Delano
Mar. 8d. 2h. to 3h.	Distinct white cloud covering about one-eighth of Claritas.	Moore
13d. 2h. 5m. to 3h. 15m.	} White area over Thymiamata.	Moore
15d. 1h. to 2h.		
23d. and 28d.	Small white patch over Thymiamata.	Gainsford
Apr. 2d.	Small and very bright area in Neith Regio.	Gainsford
5d. 4h. 15m.	Blue cloud on west limb over Elysium. Light haze over Utopia and Boreosyrtsis.	Delano
9d. 3h. 0m.	Bright cast limb cloud over Nilosyrtsis.	Delano
14d. 3h. 45m.	Haze over Trivium Charontis and Propontis.	Gainsford
15d. 17h. 0m.	Bright yellow irradiating patch over western part of Cydonia.	Gainsford
23d.	Light area over Meroe on limb.	} Botham Gainsford
30d. 18h. 45m.	Small white cloud on p. limb lat. $+50^\circ$ to $+60^\circ$ —also seen on May 4d. 17h. 20m.	
30d. 21h. 20m.	Large not very bright, white patch in Elysium.	Moore
May 1d. 2h. 0m.	Entire east and west limbs brighter than usual. Haze obscuring Oxia Palus.	Delano
2d. 2h. 0m.	Haze obscuring Oxia Palus.	Moore
2d. 22h. 0m.	Small round white cloud over Utopia.	Botham
4d. 17h. 20m.	Small white cloud p. limb $+50^\circ$.	Delano
5d. 5h. 15m.	Very bright limb cloud just south west of Ismenius Lacus.	Botham
6d. 17h. 45m.	Small white cloud in Arcadia area lat. $+40^\circ$.	Moore
6d. 22h. 20m.	Small round white cloud over Dioscuria.	Botham
8d. 19h. 0m. and	Some cloud or mist over Utopia ($240^\circ - 60^\circ$) extending to North Polar Cap and over the sunrise terminator.	} Gainsford Moore
9d. 19h. 0m.		
19d. 22h. 0m. to 23h. 0m.	Two white patches in Amazonis.	Botham
29d. 17h. 0m.	White cloud extending beyond terminator at long. 60° lat. 30° over Xanthe not more than 10° in extent from north to south.	Botham
June 3d. 17h. 15m.	Moeris L. covered by white cloud or mist.	Botham
4d. 16h. 0m.	Moeris L. free of cloud. Libya very bright and white.	Gainsford
5d.	North part of Syrtis Major obscured by long white cloud extending north to south and irradiating. Very small irradiating yellow cloud or terminator over Chryse.	Botham
7d. 17h. 30m.	Syrtis Major isolated by cloud over Iapigia, white intensity 1. Libya also white, intensity 1.	Botham
8d. 17h. 0m.	Large wide belt of white cloud from Iapigia and Libya to Amenthes and Aeolis.	Botham
13d. 17h. 0m.	White cloud across Cyclopaia, Aeolis and Zephyria from lat. 0° to $+10^\circ$.	Botham
17d. to 19d. and 23d.	White area over Phaethontis region at south limb.	Gainsford
19d.	Very small bright irradiating spot on terminator over Libya.	

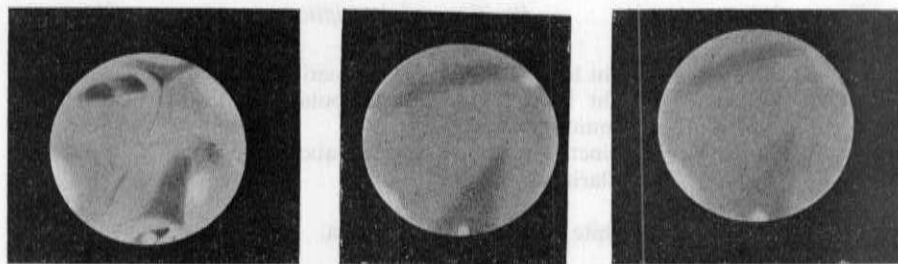


FIGURE 13. (*left*) 1967 April 23d. 21h. 10m., $\omega=6^\circ$, no filter; (*centre*) April 25d. 21h. 00m. $\omega=1^\circ$, Ilford Micro-blue filter; (*right*) April 25d. 21h. 10m., $\omega=1^\circ$, Dufay Tricolour blue filter. All with $12\frac{1}{2}$ -inch (31 cm) Spec.

TABLE II
INTENSITY ESTIMATES

Scale: 0 = Polar Cap, 10 = Background of night sky

	BOTHAM (Means)	DELANO (Means)	HEATH	APPLEYARD	TERWANGNE (Means)
Acidalium M. ..	6.2	7	6	7	4.5
Aeolis	1.6				
Aeria	2.0		0	1	2.5
Aetheria	2.1			1.5	
Aethopis	2.0				
Amazonis	2.0			1.5	2
Amenthes	1.5				
Arabia	2.0		2	1.5	2.5
Araxes	2.5				
Arcadia	2.3				
Aurorae S. ..	4.0	7	5		
Boreum M. ..	2.8				5
Boreosyrtis ..	4.4	5	3.5		5
Casius	3.6	7		5.5	5
Cebrenia	2.3				
Cecropia	3.5				
Ceraunius	3.0				
Cerberus	3.3				
Chalce	1.6				
Chryse	2.1				2
Cimmerium M. ..	4.7	7	5		6
Coprates	4.0				
Cyclopia	4.5				
Cydonia	2.8			1	
Deltoton S. ..	5.3	7			
Deuteronilis ..	3.0	3			
Diacria	2.4				
Elysium	1.6				
Erythraeum M. ..	4.3	6			4
Hadriacum M. ..	6.0				
Hellas	1.0		0		
Hesperia	5.0				

	BOTHAM (Means)	DELANO (Means)	HEATH	APPLEYARD	TERWANGNE (Means)
Hyperboreus L. ..	6.6				
Iapigia	4.3		5		
Isidis R.	1.9				
Ismenius L. ..	3.8	5			
Lemuria	3.5				
Libya	1.2				
Lunae Palus ..	3.1	4	3.5		
Margaritifer S. ..	4.0	7	5	6	
Memnonia	2.0				
Meroe	2.0				2
Meridianii S. ..	4.3	7.5	6	6	4.5
Moab	2.3				
Moeris L.	3.8	5			
Nopenthes	2.5	5	5		
Niliacus L.	5.4	7		7	
Nilokeras	3.3	5.5		6	
Nilosyrtis	3.3	6			
Olympia	1.5				
Ortigia	2.5				
Oxia Palus	2.0				
Panchaia	3.1	6	4		
Phlegra	2.6				
Propontis	3.2	5			4.5
Protonilus	3.0	5			
Sabaesus S.	3.3	7	6	6.5	4.5
Scandia	3.1				5
Serpentis M. ..	5.5				
Sirenum M.	4.3			5.5	
Sithonius L. ..	5.0		5		
Solis L.	3.5				
Styx	3.0				
Syrtis Maj.	6.9	7	7	7	5.5
Tempe	1.8			2.5	
Thoth	4.3	5	4		
Thyamiamata ..	1.5				
Tithonius L. ..	3.8	5			
Tractus Albus ..	1.5				
Trivium Charontis	3.5	5.5	4		
Tyrrhenum M. ..	4.3	7	5		5.5
Umbra	4.0				
Utopia	3.2		6	4	4.5
Xanthe	2.0				
Zephyria	2.2				
North Polar Cap	0.3				