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Mars Observations in 2005. Part II

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(Abstract)　This article is the second part of our reports our observations of Mars in 2005. We deal with the observations made at the Observatory of the Fukui City Museum of Natural History during the period from 16 August 2005 until 30 September 2005 when the angular diameter was δ=17.8" and still growing. The observations from October onward will be treated as Part III in the following issue of this bulletin.

Key wards: Observations of the planet Mars in 2005.

1. Introduction

The present part is a sequel to the previous article (Part I) published in the *Bulletin of the Fukui City Museum of Natural History*, No. 60, p.1~10 (2013). In Part I, we dealt with our observations of Mars made during the *first* period from 22 November 2004 (δ=3.8", λ=119°Ls) until 7 August 2005 (δ=11.9", λ=265°Ls) at the Observatory of the Fukui City Museum of Natural History. Here δ denotes the angular diameter and λ indicates the Martian season by the use of the areocentric longitude of the Sun (Ls). In the first period, as shown in Part I, we secured a total of 201 drawings concerning Mars whose season proceeded from λ=119°Ls to λ=265°Ls. We spend each time 20 minutes to complete each observation and usually observe every forty minutes during which the planet rotates nearly 10 degrees. We observe on the following day the same surfaces as those we observed on the preceding day. Due to the every 40 minutes observation, we will be able to meet the surfaces having the same geographic longitudes on the following day, and hence we might be able to compare the phenomena: If idealistically performed, a series of surfaces having the same (or quite same) degrees as secured on the preceding day are obtained in succession.

In the present case we shall describe our observations from 16 August 2005 (δ=12.6", λ=270°Ls) until 30 September (δ=17.8", λ=298°Ls). The telescope used was the *F*/12 20cm refractor at the Fukui City Observatory with magnifications 340×, 400×, 480× and 600×. In this second period we secured a total of 156 drawings during one month and a half: The apparent diameter has relatively increased compared with the diameters in the first period, so that each observation provided much richer data in this second period. The angular diameter was still steadily increasing in the second period: The planet Mars was destined to be closest to the Earth on 30 October 2005 with the maximal diameter of δ=20.17" and the season would reach λ=315°Ls. The planet was then at opposition on 7 November 2005. So it is expected to find further fruitful results in the coming October and November 2005, while because of the lack of space here, we are forced to postpone the analyses of the data acquired in October, November and so on until the forthcoming issues. Especially as we noted in the Introduction of Part I, almost all observations in October 2005 were made at the Lick Observatory, California, by using the famous 91cm Grand refractor. The present writer took a flight to San José, California, on 3 October and stayed at Lick until 24 October. At Lick we obtained a total of 69 drawings. The final observation at Lick was made at 08:40 GMT on 24 October and readily re-started our observations at the Fukui City Observatory from 14:00 GMT on 25 October as soon as we came back from the Lick Observatory. Since then, we observed a total of 117 times at Fukui until the end of November. So 69+117=186

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observations will be subject to the main review of the forthcoming Part III.

We here use several abbreviations of the terms. As before, the south polar cap is abbreviated as the spc, and the north polar hood as the nph. Several Latin appellations such as Mare, Lacus, Sinus, Nodus, Fretum are abbreviated respectively to M, L, S, N, Fr. For instance Mare Sirenum is abbreviated to M Sirenum, Solis Lacus to Solis L, Auroræ Sinus to Auroræ S, Nodus Alcyonius to N Alcyonius and so on. Syrtis Major is simply written as Syrtis Mj. Otherwise, φ denotes the tilt, ι does the phase angle and ω does the longitude of the central meridian (CM). Int is an abbreviation of "an integrated light transmission filter".

We shall now begin reviewing the observations made during the *second* period:

2. Observations from 16 August until 15 September 2005

On **16 Aug (λ=270°Ls, δ=12.6", φ=15°S, ι=45°)**, we observed four times from 18:10 GMT to 21:00 GMT. First at ω=097°W (Mn-202D), Auroræ S is dark, and Agathodæmon is checked. The evening terminator preceding the spc is whitish misty. At ω=107°W, Solis L was seen isolated. The following limb of the spc is very bright but smaller. The limb side of the north of M Sirenum is whitish light. Xanthe is also light near the terminator. At ω=124°W, Olympus Mons is evident as a dark spot. Phœnicis L is also a dark spot. M Sirenum is the darkest. At ω=138°W, Solis L is still visible, while it looks that a white mist haunts. Olympus Mons is visible and to the north of the west end of M Sirenum are shown some dark segments. The nph is roundish white. On **17 Aug (λ=271°Ls)**, we observed three times at 16:10 GMT, 17:10 GMT and at 17:50 GMT, and then the sky was clouded. First at ω=058°W, Argyre is rather light on the terminator side. The spc is definitely whitish bright (ap-parently smaller than before). The nph is largely seen but not so bright. Auroræ S is dark, splitting into the upper and the lower part. Margaritifer S is also dark near the terminator. Phasis is still faint. At ω=073°W, Argyre is misty whitish to the terminator. The spc is brilliant and looks wider than expected. Solis L is identified and S Auroræ is dark. At ω=082°W (17:50 GMT), Argyre is whitish misty. Ophir-Candor is light. Tharsis Montes make a series of dark spots? Phasis is visible. On **18 Aug (λ=272°Ls)**, we observed 9 times from 15:10 GMT to 20:30 GMT. First at ω=034°W, Argyre is possibly ground lit in an inverse-triangle shape with an off-whitish tint near the CM. The lower part of Auroræ S is the darkest. Chryse is reddish light. Niliacus L is evident and the nph is white widely. Lunæ L is evident with a faint Ganges. Solis L is becoming dark. Niliacus L looks bluish, while Auroræ S is brownish. Meridian S shows up near the terminator. At ω=044°W, Chryse is reddish dull. The upper boundary of M Erythræum is sharp against Argyre. Niliacus L and Acidalium M are seen more largely than expected (now note φ=15°S). The nph is brighter at the morning side (seen thru O56). Lunæ L looks darkened. At ω=053°W, Solis L is more inside. Agathodæmon is clearly visible, Ganges is broadly evident and the following mist of Lunæ L is rather thick so that Lunæ L looks weaker. The nph's brightness is not uniform. Chryse looks reddish dull. Auroræ S is separated from its southern neighbourhood. Ophir-Candor is usually light. At ω=063°W, Solis L has become considerably dark, and Agathodæmon and Tithonius L are definite due to the brightness of Ophir. Nectar is visible parallel to Agathodæmon. Phasis is visible, while it is hard to distinguish each of Tharsis Montes. At ω=073°W, Solis L is darker than Auroræ S. Phasis is apparent. The eastern area of Argyre looks duller because of the evening. The northern part of Xanthe is light in the evening. The nph is white/bright but smaller. The Tharsis ridges are shown up. At ω=083°W, Argyre is misty whitish, and to the south of the nph (which contains a small bright core) there is seen a dark segment. The morning limb is light through the G filter. At ω=092°W, Auroræ S is near the terminator, but Ophir-Candor is still bright. Argyre is now dull. At the morning side M Sirenum is appearing; maybe of a dark bluish tint. The area to its south is fade. The area of Arsia Mons is shadowy. At ω=102°W, Olympus Mons is detected as a brownish spot and its northern neighbour is faded. Arsia Mons may be less definite than Phœnicis L. The area of Arsia Mons

may be blue shadowy. Others are rather brownish. Temperature inside the dome is 26°C. At ω=112°W, M Sirenum is completely visible. Olympus Mons is brownish and near the CM of the illuminated disk. Phasis is weaker than Solis L and M Sirenum. Near the terminator, area around Xanthe is hazed. The morning limb is misty light down to the nph. On **19 Aug (λ=272°Ls)**, we observed 9 times from 15:10 GMT (ω=024°W) to 20:30GMT (ω=102°W). At 15:10 GMT, the altitude of the planet is quite low. At ω=024°W, the tilt was ϕ=15°S so that the south polar cap (spc) is very bright. Argyre is off-white and well light. At the evening terminator, Noachis is misty. S Meridiani is a bit seen. Auroræ S is the darkest. Solis L is coming but still weak. The eastern part of Niliacus L is darker. The nph is whitish obvious, and light up the morning limb mist in G. 40 minutes later, at ω=034°W, Argyre looked larger and light. Noachis is whitish misty light near the terminator. There is seen a light patch at the southern part of Xanthe. Ophir is already bright. The nph is whitish light. At ω=044°W, Solis L is showing up. Chryse looks reddish. Argyre is also largely reddish light. Ophir is conspicuous. Nilokeras L is dark. Temperature reads 28°C. At ω=054°W, Solis L is now more complete, while still Auroræ S is the darkest. Lunæ L looks darker. The Tharsis ridge is appearing. Solis L is more inside: Phasis is visible and it is connected with Phœnicis L. Argyre is rectangular. The area following the spc is bright. At ω=063°W, we made use of a Y48 filter. Inside Xanthe, a bit light patch is visible, as light as Ophir. There is seen a light streak preceding the Tharsis streak. Argyre looks duller beneath the evening mist. The nph is not uniform in brightness. At ω=073°W, we also use O56. Solis L is considerably inside the disk. Agathodæmon is clearly seen, and Ophir is bright. Lunæ L is darker. The preceding streak of the Tharsis line is rather bright while the following streak is shadowy. Olympus Mons is now appearing. The nph is made of a bright core. At ω=083°W, Ophir and Claritas sometimes shine. M Sirenum is coming. The nph is still white evident. At ω=093°W, the planet shines at higher sky near the meridian. It is cloudless, but the seeing does not improve. M Sirenum has become darker. To the north of Olympus Mons there is a visible light zone. At ω=102°W, the summit of Olympus Mons is now apparent as a dark spot encircled by light donut. A shadowy area follows the Olympus area. M Sirenum dark featured. Phasis is rather clear. Just before sunrise. On **20 Aug (λ=273°Ls, δ=13.0", ϕ=15°S, ι=45°)**, we ob-served 8 times from 15:10 GMT to 19:50 GMT. First at ω=015°W, Argyre is visible but looks duller. The evening mist at the upper Noachis is conspicuous. S Margaritifer and S Auroræ are definite. Meridiani S is dark near the terminator. Nilokeras is darker than expected. The nph has a core at the morning side. At ω=025°W, Now Meridiani S is faint. Solis L is coming in. Argyre's northern part is lighter. Noachis is misty. Chryse is normal: The upper part looks reddish light. A light core is visible between Nilokeras and Niliacus L. At ω=034°W, Upper Chryse is lighter though dull. Nilokeras looks broad. Lunæ L is evident. The spc is clear and brilliant, while the dark markings are not dense including Auroræ S. At ω=044°W, Argyre is more reddish than the northern desert. Auroræ S is the darkest located near the centre of the illuminated disk. Chryse and Xanthe are lighter than Argyre. Ophir is now brighter. Solis L is dusky. Agathodæmon and Tithonius L are evident. The nph is complicated, maybe active. At ω=054°W, Solis L now makes a shape with a presence of Phasis. Margaritifer S is now faint near the terminator. The Tharsis ridge is visible as a shadowy segment. Transparency is rather good, but the disk looks yellowish in general without the particular reddish colour. At ω=064°W, The core of Solis L is now the darkest. Evening mist is clearly seen through 600×. Ophir and following the classical Tharsis area are bright. Compared with these, Argyre is duller. Xanthe is misty light in different colour than Ophir. The lower boundary of Argyre or the upper coast of M Erythræum is sharp. At ω=073°W, Ophir is bright as well as the following area of Tithonius L. Argyre looks dusty + condensate. Xanthe near the terminator shows a misty matter. At ω=083°W, Argyre is near the terminator covered by a mist. Solis L looks rather brownish dark. Ascræus Mons is visible. Ophir is lighter than the others (except for the spc). Phasis is visible with the light Claritas. Its following

limb-side area is off-whitish bright. On **23 Aug (λ=274°Ls)**, we observed from 17:10 GMT to 19:40 GMT under some cloudy conditions. At ω=015°W, half of Sabæus S is visible. Aram is light, which well separated Meridiani S. The preceding segment of the spc is faint (maybe a trace of Novus Mons. According to our analysis of the case in 2003, the disappearance of Novus Mons occurred around at λ=269°Ls, and so it will be possible to detect a remnant of Novus Mons until this season). It was noted the northern neighbourhood of the spc was quite shadowy. Argyre looks reddish light. Chryse has a bright part. Nilokeras is dark. At ω=025°W, the spc was quite clear. Argyre and its east are light. The southern terminator is misty. Nilokeras shows up. Then it was clouded, and so the next observation was made at ω=042°W: The evening mist is quite white over Noachis and Argyre. Argyre shows a square shape. Aram is bright near the terminator. The following area of the spc is well faded. Agathodæmon is visible. Nilokeras well shows up. The mist following Solis L is strongly whitish near the morning limb. Both sides of Agathodæmon are in different colour. Finally at ω=052°W, Argyre shows a rectangular lighter shape, and its east is misty-white near the terminator. Morning mist is thick to SW of Solis L. Tharsis ridge is coming. Solis L is quite dark now. On **27 Aug (λ=277°Ls, δ=13.7", φ=14°S)**, we ob-served 6 times, from 14:30 GMT to 19:10 GMT: First at ω=298°W, Syrtis Mj prevails on the afternoon side. The area of M Serpentis is evident. Hellas shows a reddish tint inside with a brighter part at the northern part. Trinacria also shows a lighter patch. Æria and Moab are reddish. The southern evening mist is not so clear. At ω=308°W, S Meridiani is coming in. Edom is light. Inside Hellas, its eastern part and bottom are lighter. Novus Mons's remnant seems to exist, rather whitish. The southern hemisphere looks yellowish in general. At ω=318°W, the evening Hellas shows a brighter swath at the western corner of the inside. Even then the colour of the inside is rather reddish. A broad Noachis band exists, though not so evident. Niliacus L is appearing. The following area of the spc is light. At ω=328°W, the shape of Sabæus S looks pending down to the north. It is simply darkish together with the broad dark Serpentis M as well as the evening Syrtis Mj. Edom is light as usual, and Margaritifer S is a bit seen near the morning limb. Hellas is light roundish, slightly misty or hazed. Deserts are reddish. The spc is clear bright, followed by a light area. At ω=337°W (17:10 GMT), the spc is bright clear, while the nph is quite weak. Hellas is roundish light near the terminator. M Serpentis looks broad and dark. The sky was then clouded and unobservable until at ω=007°W (19:10 GMT) where Margaritifer S is dark definite and the Auroræ S already shows the darkest core. The southern evening terminator is misty (different in colour from the area of Argyre). The spc is clear, while the nph is not so conspicuous. Niliacus L is visible. On **28 Aug (λ=278°Ls, δ=13.8")** we observed nine times from 15:10 GMT to 19:50 GMT. At ω=299°W, still low, the northern deserts are reddish among them Æria is lighter. Libya looks a bit misty light near the terminator. Hellas is a bit reddish though less reddish than Æria. The evening terminator side of Hellas is misty. At ω=308°W (15:50 GMT), the disk is never yellowish. Deserts show reddish or pinkish tint. Hellas also has a tint of red or pink though its NW core part is crème colour. The nph is white but its boundary is not sharp. Deucalionis Regio is not bright, nor reddish. S Meridiani was already seen at 15:40 GMT, while not at 15:20 GMT. And so we may say it began to show up from the limb around at 15:30 GMT (ω=304°W). At ω=318°W, the nph is thin so that Niliacus L is totally visible in a bluish tint. The deserts are reddish. The disk limb side is airborne dusty. Especially whole of Noachis is rather dirty. Hellas is still a bit reddish, and the western dark border looks to sharply pierce downward. S Sabæus is dark black. Maybe a remnant of Novus Mons is detected. At ω=328°W, Hellas is now hazy light in the evening. Argyre is whitish light and lighter than Hellas. The northern deserts look reddish. Margaritifer S is clearly seen bordered by the limb light. The eastern part of S Sabæus is broader together with M Serpentis. At ω=338°W, Argyre is also ruddy, not so whitish. The nph which covers the northern morning limb is most whitish bounded by Niliacus L/M Acidalium. Hellas is no more whitish light (in G, it is slightly light), while

Argyre is brighter than Hellas. Two Aryn's nails of Meridiani S are now clearly visible. At ω=348°W, the spc is roundish clear showing a distinct perimeter. A light segment is visible on this side of the circumpolar ring. Hellas is now dull misty (light however in O56). M Acidalium is still beneath the morning cloud connected with the nph (which looks too declined westward). Aram and Edom are bright. Now the surface general looks yellowish even through Or-4mm ocular. At ω=357°W (19:10 GMT), the planet just before the meridian. The spc looks totally inside the disk. Argyre figures in a reddish tint but not bright. Hellas is dull misty. The area of Depressiones Hellesponticæ is wine-coloured. The reddish deserts are now at the evening side. Chryse is also ruddy. Niliacus L is now quite dark. At ω=007°W, the eastern end of M Erythræum is definitely connected with M Serpentis. The nph which covers M Acidalium is quite large. Niliacus L is explicitly out and dark. Ganges is faintly seen. (Seeing is moderate, but markings on this side are not thick. Chryse's ruddy colour is also weak.) At ω=017°W (20:30 GMT), the nph is large and blue-whitish compared with the spc (slightly off-white). The evening terminator mist is visible as well as the morning mist at the coming Solis L area. Argyre is dull to Noachis. Niliacus L is now well visible. On **29 Aug**, we observed 8 times from 15:10 GMT to 19:50 GMT. At ω=289°W, both sides of Syrtis Mj are ruddy: The preceding desert is less dark, but has well a tint of red. The spc is clear, but its outskirt is obscure. The upper boundary of Hellas faintly seen: Hellas' northern bottom shows a bright core. M Serpentis is largely darkened. At ω=309°W, Hellas, now on the evening side, looks covered by a mist wholly (Int+G). Æria and Moab are reddish. The circumpolar ring is not so light. The bright core of Argyre is at the morning limb. Hellas looks lightly reddish: The upper part of NW area may be of a *cream* tint. The spc is brilliant clear. At ω=328°W, Argyre is now figured but not bright at the limb part. The nph at the morning side has no definite shape, while the limb part following M Acidalium is very white. The spc is clear and its outskirt does not look dusty. S Sabæus is not black nor brown, nearly blue black. The upper part of Hellas is ruddy; the northern desert is ruddier. At ω=338°W, the eastern end of S Sabæus and M Serpentis together make a fat darkish marking. The upper boundary of Hellas is sharply defined. The nph is not so conspicuous as yesterday. The northern desert looks ruddy but the southern hemisphere looks dusty extensively (600×, 400×). However the circumpolar band does not dusty. S Sabæus also looks in a dusty colour. It is notable that Depressiones Hellesponticæ is considerably dark. At ω=348°W, the spc is purely whitish but the disk is quite yellowish. The northern deserts look ruddy. The Hellas bottom is still bright. The nph is now thin but white. At ω=357°W (19:50 GMT), the spc is of a bit off-white. Hellas is near the terminator and looks dull and a bit misty. The nph is now thick white. The disk is quite yellowish and the markings not dense (partly because of the poor seeing?) The deserts are slightly ruddy in good contrast with the white nph. On **31 Aug (λ=280°Ls, δ=14.1")**, we observed 6 times every 40 minutes from 15:10 GMT to 18:30 GMT: First at ω=270°W, the preceding part of the spc is dusty light. Syrtis Mj and other dark markings are very definite. Hellas is roundish evident but never bright, though the lower part of the inside is like as a comma-shaped core. Libya is bright. Higher latitude dark band is visible. The nph is a bit seen. Utopia is faintly bluish. Æria is already pinkish. As well as the preceding desert. Trinacria is also reddish. At ω=280°W, The spc is now clearly seen (narrower than before), while the circumpolar area is dull. Hellas is figured out very roundish. Its lower part is brighter. M Hadriacum is totally visible. Ausonia is ruddy. At ω=290°W, the south circumpolar area looks faded, but never bright. The spc is very clear. Hellas looks to have a fine structure inside. Æria-Moab is ruddy. Evening mist has weakened. At ω=300°W, the spc is very clear and bright. The lower part of Hellas is light. Yaonis Fr looks very straightforward. Edom is visible now popped out from the morning mist. The nph is quite vague. At ω=309°W, the spc is clear definite. Inside Hellas, a shadowy band down to Zea L is clearly seen, and following NW area of the inside is bright, not yet inside the evening mist. The circumpolar region is light though not bright, may be a dust-fallout. The nph is weak but begins showing the thick morning cloud. At ω=319°W,

the deserts are well pinkish, but the markings look fainter in general. The higher latitude markings are of the wine-coloured. Hellas figures at the evening side but never bright; rather misty. Argyre is not so bright. The nph is weak. Noachis looks shadowy in general. After the next observation by T NAKAJIMA, the sky became cloudy. On **1 September (λ=280°Ls, δ=14.2", φ=13°S, ι=42°)** we started from 14:30 GMT and observed 8 times, first irregularly, until 19:50 GMT: First at ω=251°W (14:30 GMT), M Tyrrhenum is at the centre of the disk. The northern desert preceding Syrtis Mj, which is well defined, looks ruddy. Hellas is roundish defined on the morning side (rather dull, in a crème colour). The circumpolar area is faded and the spc looks as if it is a part of the faded area. The area of Tiphys Fr is quite dark. Next we were forced to observe at ω=266°W (15:30 GMT) because of a float of clouds. Hellas is totally inside the disk: Trinacria looks as before (as in 2003). M Cimmerium is now fainter. On the other hand, S Sabæus' tail is just coming in. The spc is very clear while the preceding area is faded. The eastern neighbourhood desert of Syrtis Mj is quite ruddy. At ω=278°W (16:20 GMT), Æria is reddish. Inside Hellas, Zea L is visible and the NW corner is brighter. The spc is clear. M Serpentis and the end of S Sabæus are already dark. At ω=290°W (17:10 GMT, on the regular basis), Syrtis Mj is near the CM. the following Æria is reddish. Also as well Trinacria and Hellas show a tint of red. Once the seeing improved and Yaonis Fr was clearly seen. The spc is clear. The evening mist looks weak. The nph is indefinite, just white at the limb. At ω=300°W (17:50 GMT), the spc is clear and very independent. The preceding area looks now well separated from the spc. Hellas has a fine structure: Its upper part is ruddy and its NW part is ruddy bright. Trinacria is also ruddy light still. The evening terminator looks governed by a mist. Æria is ruddy. The southern higher latitude markings are wine coloured. At ω=310°W (18:30 GMT), the spc is clear. Hellas's NW part is bright while such markings as Zea L are visible. Hellas is in general ruddy but less ruddy than Æria. Yaonis Fr is sharply seen. The nph does not well show up. Edom is as light as Hellas's NW corner. At ω=319°W (19:10 GMT), the nph shows up concealing M Acidalium on the morning side. Libya must be beneath the evening mist. Still the NW corner of Hellas is evident. The Noachis band looks reddish. Æria is most reddish. The higher latitude markings show a wine-coloured tinge. On **3 Sept (λ=281°Ls)**, we observed 6 times from 16:50 GMT under clouds passing condition: At ω=271°W, Hellas is roundish: The upper bound is dark evident. Yaonis Fr is visible. Ausonia is less bright than Hellas. Syrtis Mj is the darkest, darker than M Serpentis yet. A small bright patch is visible at the nph area. At ω=281°W, the spc is clear white; its preceding area being off-white while the following area slightly bluish white. Noachis is rather shadowy though the limb part is under a morning mist. Hellas is rather reddish. Trinacria is less bright than Hellas but has a ruddy tint. Æria is most ruddy. At ω=291°W, the nph is weak. The spc is pure, isolated, and clear. The lower inshore part of S Sabæus is quite dark. M Tyrrhenum is also dark, darker than Iapygia Viridis. The northern deserts are reddish. At ω=300°W (19:10 GMT), Hellas roundish and has a bright swath at the western corner, while Hellas shows a reddish tinge in general. Just Æria is more reddish. Libya is misty. Noachis is quite dull. At ω=310°W, Æria is quite reddish. The higher latitude markings are wine-coloured. Noachis is reddish dull. Yaonis Fr is sharp. Evening mist is seen from south to north along the terminator. S Sabæus is independent of M Serpentis because the lower inshore line of S Sabæus is darker and limited. Bright thick mists cover the limb following S Meridiani, and the morning limb following (possible) Niliacus L. At ω=320°W (twilight), Hellas appeared rectangular at the first glance. The spc is bright clear while the nph is obscure. S Sabæus is very apparent. On **8 Sept (λ=285°Ls, δ=15.0", φ=12°S, ι=40°)**, we observed 8 times from 14:50 GMT to 20:10 GMT. First at ω=191°W, the south circumpolar area looks faded though the spc is bright. Hellas must be bright on the morning limb. The nph is thick. The Ætheria dark patch is coming, and follows Cerberus, but the former is more evident as a streak near the limb than Cerberus. The northern desert is pinkish. The evening terminator side looks whitish. Eridania has a light patch. The

southern evening mist is weakly seen. Cerberus is brownish, and the southern M Chronium is also brownish. At ω=200°W (15:30 GMT), M Cimmerium is bluish dark. M Tyrrhenum is also bluish. The Ætheria dark patch is evident bluish. Notably the so-called Valhalla is visible to the north of M Cimmerium. M Sirenum is a bit seen. There is seen a very bright spot near the terminator preceding the spc. The morning side is globally whitish. The afternoon desert is ruddy. Hellas is still on the morning limb. At ω=210°W (16:10 GMT), M Chronium is brownish. The bright whitish core on the terminator to the east of the spc is still visible. Hellas's upper side is still bright on the morning limb. The circumpolar light area is never bright, maybe just a fallout of dusts. Elysium is ruddy as well as the desert: Eridania has a light patch (by 600×). At ω=219°W (16:50 GMT), Syrtis Mj is a thin segment near the morning limb. We witnessed that Syrtis Mj was detected near the limb at 16:32 GMT (ω=215°W). Hellas is partially seen, but bright or brilliant, less whitish than the area of the circumpolar area. Notably there is a slit between the dark M Tyrrhenum and the following limb. The nph is large, and looks declined. The NW tip of M Cimmerium is a bit crooked upwards. (At 17:30 GMT we could not observe because it was clouded.) At ω=239°W (18:10 GMT), Syrtis Mj is light bluish. Hellas is largely bright. The desert is ruddy. The nph moved beneath the Ætheria dark patch. At ω=249°W (18:50 GMT), Syrtis Mj is now quite evident and Hellas shows the roundish bright basin. M Hadriacum shows up and Trinacria is light clear. M Serpentis runs to the limb. Æria is whitish bright near the limb. At ω=258°W (19:30 GMT after crossing the meridian), Hellas is brighter than Trinacria. M Hadriacum is evident. Æria is still limb bright. At ω=268°W (20:10 GMT), Hellas is well defined, but never brilliant, quite usual and brighter at the NW corner. The spc is clear; its neighbourhood is quite dull. Southern evening side is misty. The rising M Serpentis arc looks brownish. Yaonis Fr is quite sharply boarding the NW bright corner Hellas. On **9 Sept**, we observed 8 times from 14:10 GMT to 18:50 GMT. At ω=171°W (14:10 GMT), the planet is still low and we observed sitting on the top of the staircase. The spc shines but small. The circumpolar surrounding is broad and whitish quite light. M Chronium is dark. A tail of Tharsis cloud was first seen, but disappeared? Olympus Mons is no more detected. The nph is thick. Propontis I is visible. The desert was first brownish but soon became pinkish. At ω=181°W, the Ætheria dark patch is already visible near the morning limb. M Tyrrhenum is also appearing. The nph is definite. The desert looks orangish (by 400×), slightly pinkish (by 600×), but not yet seen enough. The northern border of M Sirenum and M Cimmerium looks smooth. The spc is distinguished but not clear yet. At ω=190°W, by 480×, it is difficult to identify the spc from the circumpolar faded area, while the nph is clearly seen definite. Elysium is slightly lighter than the desert (in O56 and in Int). Eridania is ground lit. Now the desert is ruddy, as well as the southern continents. At ω=200°W, on this day the spc does not appear to be clear because of the faded circumpolar area. As well Hellas on the morning limb is not particularly bright (later looked bright by 400×. Even if the seeing improves, the spc looks dull. M Cimmerium is dark-blue while the Ætheria patch and Cerberus appear brownish. Eridania is ruddy bright (ground lit). At ω=210°W, Elysium is a bit lighter than the surrounding deserts. Hesperia is clearly cut. The spc is unclear. M Chronium is dark. The morning limb is whitish. M Tyrrhenum is separated from the limb. Ætheria dark patch is zigzagged. At ω=220°W, the spc is dull, while the white patch near the terminator at the circumpolar region is evident. Hellas is also white evident at the morning limb, not atmospheric white, but physically white. Syrtis Mj is still faint near the limb. M Hadriacum is visible preceding Hellas. The deserts are ruddy including Elysium, Eridania and so on. The western tip of M Cimmerium is seen upturned at the end. Mars is now high up, but unstable because of the clouds. 25°C inside the dome. At ω=229°W, the cloud is appearing. The white spot inside the circumpolar region is still visible. Hellas is roundish light near the morning limb. Syrtis Mj is now bluish evident. The morning mist must be expanding. The nph is thicker and wider than yesterday's. At ω=239°W, Libya is light. Syrtis Mj is more evident. Hellas is roundish glittering. The spc is sometimes difficult to detect under the

poor seeing, but when the seeing improves, it shows up. The circumpolar band looks largely whitish compared with the reddish continents. On **11 Sept (λ=286°Ls, δ=15.3", φ=12°S, ι=39°)**, 22°C, we observed 9 times from 14:50 GMT to 20:10 GMT. First at ω=162°W, the spc is scarcely seen, just whitish bright. The circumpolar band is not bright, similar to or slightly lighter than the continents. Evening mist exists, thickly following Tharsis. The nph is white, but not so large. At ω=172°W, the south circumpolar band looks light and white. The morning limb is also whitish light. Eridania is light (showing a slightly reddish tint). The deserts are ruddy. The evening terminator is misty white. The nph is not uniform in density. At ω=181°W (Mn-300D), the spc is definitely visible. M Tyrrhenum comes in. Trivium Charontis is dark. Eridania and Ausonia are bright. The Ætheria dark patch is already seen. At ω=191°W, the southern evening mist at Phaethontis is explicitly visible together with a misty belt to the north of M Sirenum. The desert looks ruddy to the east of Cerberus. Elysium is a bit lighter. M Chronium is wine-coloured. The Ætheria dark patch is conspicuous on the morning side. At ω=201°W, The nph is a big thick patch adjacent to the Ætheria dark patch declined to the west. Hellas is appearing from the morning limb, but not yet bright. The circumpolar region is seemingly just like the desert and not atmospheric. At ω=211°W (18:10 GMT), the spc is dull white. The nph is thickly seen (whitish bright). M Hadriacum is a bit seen. At 18:15 GMT, Hellas seemed bright. However, the nph is more evident and whiter. At ω=220°W, the fog was cleared. Hellas is well bright even near the limb. M Hadriacum is evident, bounding Hellas. M Chronium is wine-coloured in good contrast with the dark-bluish colour of M Cimmerium. Syrtis Mj is faintly visible near the limb. The Ætheria dark patch looks dark-brownish. The coming Hellas is less whitish than the spc. The nph appears large. The continents show a ruddy colour quite the same as the northern deserts. At ω=230°W, Hellas is whitish bright bounded by M Hadriacum still near the morning limb. The spc is similarly whitish bright (but narrow). Between the two, a reddish area occupies. Syrtis Mj is more evident but still faint. Its following limb neighbour is whitish bright. The nph is fat and white. Ausonia looks off-white, lighter than the deserts. At ω=240°W, The spc is now clear definite. The circumpolar faded area looks slightly reddish. Syrtis Mj has become darker, but still bluish. Hellas is roundish white/bright, less bright than the sharp spc, and less white than the nph which is largely evident. The Ætheria dark patch is brownish. Libya is slightly lighter. On **12 Sept (λ=287°Ls, ι=39°)**, we observed 10 times from 13:30 GMT to 19:30 GMT. At ω=133°W (at 13:30), the shadow of Olympus Mons is brownish, and the following aureole is light. The Arsia cloud is visible when the seeing is improved (though the G filter also). The spc is evident. The nph is whitish thick. At ω=143°W, Amazonis is reddish. The neighbourhood of the spc is dull though near at the CM. The vicinity of Arsia Mons looks whitish and the following area is lighter. The shadow of Olympus Mons is now obscure but its aureole ring is light. At ω=153°W, the spc is quite clear and independent. The Arsia cloud exists but not so explicit. Olympus Mons is obscure. Cerberus is coming in, and Propontis I is quite dark near the edge of the nph. The southern evening mist exists. At ω=162°W, 26°C, the spc, clear, is separated from M Chronium. Southern evening haze exists. The Arsia cloud has become slightly thicker. Cerberus is obscurely visible. Elysium is not particularly bright near the morning limb. M Cimmerium looks completely inside. Amazonis is reddish. At ω=172°W, Valhalla is quite shadowy to the north of the west end of M Sirenum. The spc is clear, white and bright. The southern evening mist is visible. The Arsia cloud is now obscure. The nph is large and rather thick. Tonight the reddish tint does not well show up due to a slight orange-yellowish haze. At ω=182°W, the Ætheria dark patch is now evident. Elysium is ruddy, ground lit. M Tyrrhenum is also quite evident with light. The nph is largely whitish bright, in good contrast with the deserts. The spc is also white/clear, but its circumpolar region is not so whitish, but dull light. The southern terminator mist is also dull, but whitish. At ω=192°W: Already M Hadriacum appears near the morning limb. The following Hellas is not particularly bright. Ausonia

is light (ground lit). Cerberus is visible and encircles Elysium (a bit lighter) with the following Ætheria dark patch, the latter being quite evident and dark. The nph is white and conspicuous. At ω=201°W, Hellas is now whitish bright near the limb. M Hadriacum is more evident. The desert is ruddy as well as Elysium. The Ætheria dark patch is quite dark and evident. Cerberus makes a shape. Nodus Alcyonius is visible. M Sirenum is now faded, while M Tyrrhenum is darker. At ω=211°W, Hellas is compactly bright on the morning limb (ι=39°). M Hadriacum is more obvious. The Ætheria dark patch is more evident, adjacent to the nph. The west end of M Cimmerium shows up as observed in 2003. Ausonia is reddish while Hellas is white. The spc is clear, whitish brilliant, surrounded by a reddish ground. At ω=221°W (10th drawing at 19:30 GMT), Syrtis Mj is now evident near the limb, though still faint. The areas of the spc and the nph are white, while Hellas is not pure whitish, maybe lightly off-white though bright. On **15 Sept (λ=289°Ls, δ=15.9", φ=11°S, ι=38°)**, we observed 7 times starting from 14:10 GMT and ended at 18:10 GMT. First at ω=115°W, M Sirenum looks darkest (tinted blue-black), while the preceding Solis L is less dark (dark-brown). Phasis is not so evident. The spc has been shrunk but quite clear though its neighbourhood is faded. When the seeing improves its size proves to be tightened smaller/clear. Olympus Mons is observable. At ω=125°W, the southern evening mist prevails. The circumpolar region is not however atmospheric. The preceding part of M Sirenum is clearly seen dark, while Claritas and Araxes are obscure. The surface colour is very yellowish but not yet ruddy. Olympus Mons' shadow is faint (brownish). The spc is clear. At ω=134°W, Arsia's cloud is witnessed. The spc is smaller, but clear independent of the atmospheric matters. Olympus Mons is vague. Solis L is going and M Cimmerium is coming. The magnification 600× is not effective. At ω=144°W, the spc appears quite clear, and white/bright. Solis L is now obscure near the evening terminator. The structure of M Cimmerium is almost all present, but less dark than M Sirenum. Arsia Mons does not show up, but the preceding terminator side is well cloudy. Cerberus is clearly visible through 600×. At ω=154°W, the spc is clear without the dark contour. Tharsis clouds are rather large and thick evident. The southern evening is visible. Olympus Mons is unknown. M Cimmerium is as dark as M Sirenum. The surface is yellowish. At ω=164°W, M Chronium is brownish (compared with M Cimmerium and M Sirenum).The west end of M Sirenum is located at the middle of the illuminated disk. The Tharsis evening cloud is explicitly seen. There covers a high-pressure air over the Japan sea, while the seeing does not improve so much. Temperature was 20°C inside the dome. At ω=173°W, A weak tail of the Arsia cloud is visible, blurred but large. Cerberus at the morning side is rather dark. Seeing does not improve so this 7th is the last on the day.

3. Observations from 17 September to 30 September

On **17 Sept (λ=290°Ls, δ=16.1")**, we observed 5 times starting from 14:50 GMT and ended at 17:50 GMT. First at ω=106°W, the spc is small but clear. The shadow of Olympus Mons is constantly visible. M Sirenum is fainter than on 15 Sept and as dark as Solis L. The southern evening side is misty. The desert is slightly reddish but in general looks dirty. At ω=116°W, the spc is clear without the dark perimeter. Now M Sirenum is darker than Solis L. The Olympus Mons' ring is visible, the preceding part is shadowy and the following area is light roundish. The southern evening mist is whitish. The surface looks airborne dusty. The nph is not conspicuous. At ω=126°W, the neighbourhood of the clear spc is faded. The evening mist now covers Solis L. M Sirenum is dark, while the following morning mist is whitish on and near the limb. At ω=135°W, The spc is clearly seen independent of the faded neighbours. The area of Amazonis to Tharsis is in orange colour. The dark spot of the centre of Olympus Mons is quite visible. The Arsia cloud was once showed up. The nph is weak, though having a couple of cores. At ω=145°W, the spc is clear/white; its preceding part is misty and the following part is off-white. M. Sirenum is conspicuous. The shadow of Olympus Mons has become quite

obscure. A cloud belt is seen at its preceding area. The Tharsis cloud is thick near the evening terminator. The surface is generally yellowish. The nph is whitish. On **18 Sept (λ=291°Ls, δ=16.2")**, we observed twice at 14:10 GMT (ω=087°W) and at 14:50 GMT (ω=097°W). The first observation shows markings to be generally normal including Solis L and Agathodæmon. Auroræ S is now narrow near the terminator and Eos must have been extraordinarily bright as well as Xanthe. Nilokeras is dark sinking. Argyre is misty whitish. The nph is clear. In the second, M Sirenum became darker. Phasis is visible. The area around Argyre at the terminator is whitish misty. Xanthe is also whitish near the terminator. The Tharsis ridge looks like a dark line. On **19 Sept**, we observed 4 times. At 14:10 GMT (ω=078°W): The spc is bright/clear. No cloud at Eos, while Xanthe may be light. Ophir looks bright: It is however orangish as well as Tharsis. Solis L near the CM is the darkest, and Auroræ S has a part of the darkest area. Nilokeras/M Acidalium are dark near the terminator. At 14:30 GMT (ω=088°W): the spc is clear and the area around Solis L looks quite normal. The Argyre mist is light near the terminator. Claritas is a bit light. The Xanthe mist has a core to the south of Nilokeras. Ganges is obscure. The classical Tharsis shows an orange tint. M Sirenum is in and darker. At 15:30 GMT (ω=098°W), the spc shows a clear definition. M Sirenum, now still at the morning side, is darker than Solis L. The surface looks dirty though every marking is apparent. Auroræ S is quite dark though near the terminator. Ascræus Mons is visible. Ophir is off-whitish light. Claritas is light. At 16:10 GMT (ω=107°W): Phasis is weak but sharply seen. Olympus Mons' shadow is visible. The surface does not show the ruddy colour, just orange-yellowish. Solis L is brownish if compared with the dark-bluish M Sirenum. On **25 Sept (λ=295°Ls, δ=17.2", ϕ=11°S, ι=33°)**, we observed 6 times from 14:50 GMT to 20:00 GMT: First at ω=032°W, Meridiani S and Solis L are evident. Aram is bright near the terminator, though no other bright areas are found (except for the clear spc). Ganges & Nilokeras are evident. Chryse is as usual. The nph is white. At ω=047°W, Meridiani S is still visible. Chryse is usually light. The line of Nilokeras-Lunæ L-Ganges is caught. There is no bright patch near Solis L. Ophir is light. The spc is clearly bright, though the circumpolar area is rather shadowy. The southern evening mist is caught: Especially Noachis near the terminator looks light. At ω=076°W, we checked possible dust disturbance, but apparently nothing. The spc is bright, and the nph is well white though the shape is indefinite. Lunæ L is brownish dark. Argyre's mist is not so conspicuous. At ω=086°W, the spc is caught very clearly, isolated. The circumpolar area is dull except at the terminator and the following limb. Inside the evening mist, Argyre may be whiter. The Xanthe mist looks to extend to the Solis L area. At ω=095°W (19:10 GMT), the spc looks like the Pope's Cap. The faded circumpolar area may be the area which has been occupied by the "largest" spc in the season. The southern evening mist is largely visible. The morning mist is also visible in spite of ι=33°, so that the area covered by the morning mist must be quite larger than it appears. At ω=108°W (20:00 GMT), Solis L and M Sirenum are equally dark: The former is dark brownish and the latter is brownish, but less brownish than M Sirenum. Now M Sirenum is completely seen. Olympus Mons and Ascræus Mons are visible. Ophir is light and Ganges is seen near the terminator. The disk is quite yellowish, while the central desert sometimes shows a reddish tint, and the southern belt is of wine-coloured. On **28 Sept (λ=297°Ls, δ=17.5", ϕ=11°S, ι=32°)**, we observed 8 times from 13:40 GMT to 18:20 GMT. First at ω=348°W, the surface shows a good configuration with Sabæus S and Meridiani S staying near the centre of the disk. Hellespontus is detailed down to M Serpentis. Edom is roundish light, and Aram is ruddy light. The northern desert is quite ruddy. Hellas, near the evening limb, is not so bright, seen in a crème tint, and its SW part is dull. The nph is white evident and shows some dark spot near the morning limb side maybe a part of the coming M Acidalium. Niliacus L is exposed together with Deuteronilus. The southern upper Noachis is of the wine colour. Around at Depressiones Hellesponticæ a dark patch is shown. Syrtis Mj is faint near the limb. At ω=357°W, the spc is clear, and near the evening terminator Hellas

is quite whitish misty. The northern desert is reddish up to the terminator. Aram and its opposite area of Oxia Palus are light. The southern Noachis is of the wine-colour. At ω=007°W, the whiteness of Hellas has decreased. The light band at Noachis to Argyre looks reddish. The ground is ruddy but the atmosphere may be airborne dusty. The higher southern latitudes are wine-coloured. The nph is brighter at the morning side. At ω=017°W, Hellas shows no trace. The spc is clear. By 400×, the southern hemisphere is generally wine coloured and the northern desert is reddish including Chryse. The trace of Syrtis Mj is quite dusty near the terminator. Auroræ S looks isolated. No dust disturbance at the coming Solis L near the limb. At ω=027°W, Solis L is already dark (dark blue). Agathodæmon is evident with Tithonius L. Ophir is bright (as well as Aram on the other side). Chryse is well ruddy. Ganges is broadly visible. The nph looks very white. At ω=037°W, the west coast of Margaritifer S is sharply dark, while Meridiani S is obscure near the terminator under the evening white mist. Ophir is much brighter than the opposite side of Agathodæmon. Chryse is reddish. Argyre appears dull. The following limb of Solis L is quite misty. At ω=046°W, Aram is still bright near the limb. Ophir is also bright. Thaumasia also looked bright. Meridiani S remains a bit seen. Solis L is quite dark, and Nectar is evident. S Auroræ is the darkest marking. The spc looks flat. At ω=056°W (Mars is high up at meridian), Agathodæmon is quite dark and Ophir is bright. Niliacus L is fainter than itself when it appeared from the morning limb. Southern markings are wine-coloured including Thaumasia. Chryse is reddish: The upper Chryse is lighter. The evening haze is down to Chryse. The spc is flat. On **29 Sept (δ=17.6")**, we observed 5 times from 13:40 GMT to 16:20 GMT. First at ω=338°W, the spc always visible and the upper Noachis is wine-coloured. The northern deserts look quite ruddy. Hellas is half sunk, the remainder still being roundish and whitish misty. Syrtis Mj is near the terminator but still looks wide. Aram is already bright (as usual). The nph is white. Deuteronilus is visible. At ω=348°W, the spc has become a bit smaller, but still roundish (ϕ=11°S). The remaining Hellas is dull and slightly off-white. The northern deserts are ruddy, though the image is yellowish in general. Argyre is a bit light, but never atmospheric. At ω=358°W, the spc is clear and independent. Hellas is almost concealed. Syrtis Mj is a bit seen. The deserts are ruddy. The ruddy colour is denser near the terminator. Aram is bright. Nilokeras L is quite dark, and Chryse is ruddy. At ω=008°W, a trace of the misty Hellas is still seen. Chryse is ruddy as well as preceding deserts. Under a poor seeing, the surface is in general sandy coloured. Just Niliacus L looks dark blue adjacent to the thicker nph. At ω=017°W, Hellas is no longer, but the mist looks to govern the terminator area. We now close sessions because the sky has become hazy, but we are sure that the area of Solis L is not suffering from the possible dust disturbance. Solis L is apparent near the morning limb. The limb area is however slightly whitish misty. Aram is bright, and the deserts remain reddish. On **30 Sept (λ=298°Ls, δ=17.8", ϕ=11°S, ι=30°)**, we observed three times at 13:40, 15:40 and 16:40 GMT under an unpreferable seeing condition. At ω=329°W, the northern deserts are quite reddish. Æria is especially ruddy. The area around Mare Serpentis is very massive, more conspicuous than Syrtis Mj. The northern end of Hellas looks covered by a thick white cloud. The northern light area of Hellas appears to be broadly connected with the morning Argyre area. The nph is white/bright. At ω=358°W, Hellas is dull, having a remaining misty patch or two near the terminator. Yaonis Fr is visible. The morning limb is also misty: No particular bright spot near the limb. The spc is clear. Today the nph looks to have a shadowy area adjacent to the morning limb or we may say M Acidalium appears to be cut by the nph. At ω=329°W (Mn-358D), the Solis L area is whitish misty, but no bright patch is caught. It is notable that the mist at the evening terminator which looks quite thick. A half of S Sabæus is sunk. Any split detail of M Acidalium is caught no longer. Now the sky is rather cloudy.

4. Outlook for the Opposition Period

As was described in Part I, on 3 October the author took a flight to the US and intended to

continue the observations at the Lick Observatory. The angular diameter has grown up to δ=18.5" on 6 October. We stayed there until 24 October (δ=20.0", ι=13°). From 25 October we were at the Fukui City Observatory, and readily resumed observing. We welcomed the opposition on 7 November 2005. Anyway as to the still important reports of the observations after October 2005 we shall postpone to the next issues (Part III).

2005年の火星観測報告（その2）

南　　政 次*

（要旨）前稿の第二部として，2005年8月16日から9月30日までの福井市自然史博物館天文台での火星観測内容を報告した．紙数の関係上10月以降の観測は次号で報告する．

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