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Night Thoughts of a Classical Mars Observer—Part II

By

William SHEEHAN

The late Gérard de Vaucouleurs (1918-1995) best remembered today as a galaxies astronomer at the University of Texas at Austin but a leading Mars observer in his day, wrote an interesting, if opinionated, article in 1965 entitled "The Slow Progress of Martian Studies."[1] On the eve of Mariner 4 (1964), de Vaucouleurs cast a long and often scathing glance back at the history of Martian studies since the turn of the (20th) century, and noted that the "growth rate" in published papers was only about 6 percent per year, with bulges following the perihelic oppositions (1909, 1924, and 1956; in 1939, the effect was blunted, owing to the outbreak of World War II). He added that many of the papers that appeared in the post-Sputnik era, under the stimulus of the so-called "space race," were hasty, and that "results or interpretations were offered (usually with much fanfare) that had to be withdrawn (more quietly) afterward." He added (p. 181):

This is not to say that in the pre-sputnik era all Martian studies were reliable and well-considered; far from it. The signal to noise ratio has always been low. But the confusion has been compounded and the input rate so multiplied that a quiet, sober assessment of our current knowledge of Mars is very difficult. Noise is increasing faster than signal! I would estimate that while the volume of publications about Mars during the past decade [since the perihelic opposition of 1956] was over twice the total for the previous half-century our reliable knowledge of the planet has not increased proportionately.

Among the controversies that de Vaucouleurs referred to were the supposed secular acceleration of the satellites of the planet which led the Russian astronomer Shklovskii (1916-1985) to infer that they were hollow, and hence might be artificial; W. M.

Sinton's misidentification (1956) of new absorption bands in low-resolution infrared spectra of the surface of Mars that were inferred to be evidence for the existence of chlorophyll but proved to be telluric in origin and produced by the heavy water molecule HDO; ideas that de Vaucouleurs regarded as premature about the nature of Martian surface materials, for instance, observations of their polarizing properties which were found to match a fine-grained limonite. His argument against the latter identification is worth citing (p. 188):

> Limonite is a sedimentary rock on Earth; if Mars has never had much water, how could sandy sediments cover three-quarters of the planet's surface? In fact another proposed identification based on infrared reflectivity invokes the igneous rock felsite and recent spectrophotometric observations are reported to match felsite better than limonite….

He was no fan of Dean McLaughlin's theory (1954) that the dark albedo markings consisted of windblown dust blown from active Martian volcanoes located at the sharp tips of some of them, and was singularly unimpressed with the "purported observations of bright flashes" which had been taken as evidence of volcanic theory. (The most famous of these reports were made by Japanese astronomers. For instance, on June 4, 1937 Shizuo Mayeda (1914-1952, or named otherwise Haruhisa Mayeda), using an 8-inch reflector, saw an intense point of light suddenly appear near Sithonius Lacus; it scintillated like a star and disappeared after five minutes; a similar observation, at Tithonius Lacus, was reported by Tsuneo Saheki (1916-1996) on December 8, 1951; a sudden brightening was observed by Saheki at Edom Promontorium on July 1, 1954, and so on.) The French astronomer writes scathingly, evidently referring to Saheki's 1951 observation (p. 187):

> Some purported observations of bright flashes on Mars, sometimes quoted as evidence for volcanic activity (not to mention hydrogen bomb explosions or optical signals from the natives!) are probably illusory or spurious. I have investigated in detail one such "observation" and found that at the given time the face of Mars depicted in the report was not turned toward the Earth. Also the amount of detail shown on the drawing was utterly beyond the capability of the telescope used (of any telescope, in fact, since Mars was a mere 5-seconds of arc in diameter). A letter of inquiry to the observer elicited no clarification.

Having worked himself into a lather of outrage about amateur observations of flashes or flares on Mars, he takes a further stab at the "continued flood of amateur drawings showing a Martian surface covered with a canal network straight out of Percival Lowell's books," and continues: "It is unfortunate that most of the aerospace industry pictorial publicity (and even a recent Air Force chart) should perpetuate this bad optical illusion."

Of course, these comments were made on

the eve of the spacecraft reconnaissance of the red planet, when at last the signal to noise ratio began to improve significantly (and Mariner 4 itself showed a crater-pocked surface and no canals, finally demolishing once and for all the Percival Lowell-inspired dream of intelligent canal-builders on Mars). Even more striking were the revelations of Mariner 9 (1971), which provided the first high-resolution views of the entire surface of Mars from orbit and revealed those grandiose features which then seemed so strange and unexpected: Olympus Mons and the Tharsis shield volcanoes, Valles Marineris, the dry riverbeds. (I hasten to add that the initial dour impression of a dead and cratered Mars like the Moon after the Mariner 4 and even the Mariner 6 and 7 flybys proved to be even more wide of the mark than the pre-Mariner interpretation of the planet; which proves that improved signal to noise without a large enough sample size can be even more misleading than low signal to noise with a large sample size. The classical observers at least had the advantage of being able to survey the whole Martian world at a glance—or at least the hemisphere of it that happened to be in view during a given observations—as opposed to the narrow strips of Mars shown by the flyby Mariners.)

Over forty years after Mariner 9, we can look back to de Vaucouleurs' essay with a modicum of amusement. It seems to me that the classical astronomers he takes to task didn't do so badly after all. The hollow Martian satellites have fallen by the wayside, obviously, and Sinton's observations were an innocent mistake—necessarily, he had had to obtain his comparison solar spectrum in the daytime several hours after the Mars spectra were obtained, and it turned out that on the day he had done this the air was considerably drier than on the nights when the Mars spectra were taken (the same problem of comparing spectra under identical atmospheric conditions had hampered attempted detections of water vapor in the atmosphere of Mars going back to the days of William Huggins and Jules Janssen). However, Dean McLaughlin's views about windblown dust accounting for the caret-shaped endpoints of the maria and the general streakiness of the Martian surface markings have proved to be prescient, and there are volcanoes (though not active) on Mars on a scale that de Vaucouleurs did not envisage. The expectations of classical observers concerning the nature of the surface materials also proved to be well-informed. The planet is swathed in an "ocean" of iron-oxide dust, and limonite, the reddish rust-brown material prominent in deserts in the Southwestern U.S. that inspired the visions of observers such as Lowell, gives the planet its reddish hue; plagioclase feldspars are found in low-albedo regions, while there are also areas rich in hematite and olivine. So the classical astronomers had much of it right. Some of these materials are associated with sedimentation on the Earth. We now know, of course, that Mars has indeed had not only volcanoes but significant amounts of water in the past. Indeed, the classical Mars—minus the canals—with a much thicker atmosphere, water-carved features on the surface, and active volcanoes—does, in fact, correspond with the real Mars—but not the Mars of today; the Mars of the first billion or so years of its career after its formation.

Lowell and other observers saw a ghost of that bygone planet, and were haunted by it. But in the ghost they recognized the features of a real world. They clearly enough realized that Mars was a planet that was involved in an evolutionary process, that it has experienced its own version of "climate change," and the general trend—toward desertification—that Lowell wrote about is broadly true. Though Mars is now a desert more harsh than any on the Earth, it once had water enough. Even now it is far from the static world depicted immediately after Mariner 4; it has clouds, and the surface is swept by dust-devils and dust storms that can become regional or even global in scope. Our entire historical record of the dust storms prior to 1971 is precious, and entirely based on classical observations—and now and then, as my collaborators and I discovered in 2009 when we were perusing the notebooks of E. L. Trouvelot (1827-1895) in the Paris Observatory,[2] a major hitherto unaccounted-for event turns up which shows that there must still be many gaps in our data-base. In this case, it was a planet-encircling and possibly global dust storm that occurred well in advance of the celebrated opposition of 1877. Trouvelot and Trouvelot alone witnessed it (he began observing long before others, including Flammarion, Green, and Schiaparelli, did so; among historical storms, its onset was nearly as early in the Martian dust storm season as the famously early one in 2001). Clearly, the earlier record of these events is patchier than we might wish, presumably because—unlike Trouvelot, who was an unusually compulsive observer—most astronomers saw little point in studying Mars far from opposition.

As in the past spectra of two bodies obtained under similar conditions—such as the Moon and Mars--were used in the search for water vapor in the atmosphere of one relative to the other (with the obvious pitfalls that Sinton's sad case illustrated), a comparison of the classical meteorological record of Mars, which began in 1877 with Trouvelot's observations, with that of the Earth, where reasonably good temperature records go back to 1880, allows us to draw conclusions about the nature of climate change on these two planets. It has become abundantly clear that whatever drives climate change on Mars (mostly solar insolation, but with some effects produced by changes in the distribution of albedo features) is not the same thing as what is driving it on the Earth, where the signal of anthropogenic effects has risen unmistakably above the level of noise since the late 1990s and early 2000s.

Finally, de Vaucouleurs was overly dismissive of the flashes. As is well known to readers of the CMO, the past records of the Edom flares were found to occur around the time when the sub-Earth and sub-Solar points nearly coincide, and this led Thomas Dobbins and I to issue predictions of such an event occurring again in June 2001. Inspired by this prediction, a group of observers set out for the Florida Keys, and recorded (visually and with video imaging) an event very like that which Saheki described in 1954 (and other observers again in 1958). Needless to say, this led us to try to identify some peculiarity about the surface at Edom—and also at Tithonius Lacus, the other site most commonly associated with flares. To the considerable disappointment of my colleagues and me, high-resolution spacecraft images of the Edom site showed nothing remarkable in the landscape associated with the 2001 flare; but more recently, we have discovered that the Thermal Emission Imaging System (THEMIS) of the Mars Odyssey spacecraft, used to map the distribution of Martian surface materials, identified that the Edom flare site was rich in two materials—plagioclase and calcium-rich pyroxene. These minerals are feldspars, silicates that crystallize from magma. The Tithonius Lacus site proved to be even richer in these minerals.[3] Currently, our best thinking is that a notion first offered by San Diego State University emeritus professor Andrew Young at the time of the 2001 observations is probably correct; "if you need a surface inclined by more than a couple degrees," he wrote to me, "you'd be better off trying to do this with aligned mineral grains. On the Earth, it's not uncommon for minerals like feldspars to be highly aligned in igneous rocks, and faulting sometimes exposes fairly large surfaces with nearly specular reflections." Readers may demonstrate this for themselves; simply pick up a boulder of feldspar, hold in a certain direction in the sun, so that the tiny facets of the crystals are all aligned, and it will shine like a mirror.

Oddly, the flashes, which de Vaucouleurs thought to be "illusory or spurious," seem to have been genuine, and rather surprisingly related not to cloud or other kinds of phenomena usually thought to be associated with specular reflections but rather with the mineralogy of surface materials at these two points on Mars.

This is not a bad record for the classical observers of Mars. Still, we would not deny that with the current armada of orbiters around the planet and of rovers on the planet, the signal to noise ratio for Martian meteorological and geological phenomena is fast approaching that for the Earth. Under the circumstances, with the exception of a few still viable projects (remote monitoring of global dust storms, monitoring for flare events, providing records useful for calibration of historical records), there is little the observer sitting at the eyepiece of the telescope watching and sketching the planet can do other than enjoy the experience for its own sake. He has become an anachronism.

Those who grew up in that romantic era when we could still convince ourselves we were doing useful work (and perhaps we were always a bit deceived as to how useful it was), and who were mesmerized by the magic of the image in the eyepiece, may well regret the passing of our era. It's also, however, inevitable. We were pioneers. We were truly working on the frontier of the science of another world (and we might as well define a frontier of science as a field in which the signal to noise ratio is low, and conjecture, supposition, and imagination must be liberally—but not too liberally--used to eke out the fragmentary nature of the data).

We sometimes hear of a "post-modern" era in literature or the arts. We are living in a "post-frontier" era. On the Earth, there are no more continents (on our own globe) left to discover. The old dreams of building from scratch on virgin land in expansive "free" and "empty" space, of gaining access to unlimited resources to support unlimited economic growth, remain with us, destructively so in a world of limits (who was it that said that man's greatest tragedy is the failure to understand the exponential curve?). We still employ political and economic models based on assumptions of limitless growth, models that made sense in a former time, in which acquisitiveness and ruthlessness and aggression were virtues; but those virtues have become vicious in a world in which there are already more than six billion of us, where the economy is global and interdependent because we all share non-renewable resources (like fossil fuels), and where all of us breathe (and pollute into) the same atmosphere.

The frontier of Martian science has also closed. Those of us who grew up during the frontier will always retain an affection for those lovely sleek long telescopes we used and the specialized techniques we mastered for using them as portals to that other world. But now those instruments and techniques are "one with Nineveh and Tyre."

I have recently been reading of the adventures of Joshua Slocum[4] (1844-1909), a skipper of Yankee merchant ships who, in the 1890s, realized the world he knew had moved out from under him. He knew precisely how to move a wind-driven ship through the chances of tide and water, but the era in which men were paid to that kind of thing was over. So he found a tubby little 37-foot sailboat rotting on the beach, named it the "Spray," and spent a year rebuilding it. Then he got on board, taking on such provisions as he could get, and went singlehanded on a trip around the world. It was the first time anyone had sailed around the world alone. Joshua Slocum had "done something fabulous but useless."

There are those of us who, no longer spry, still wield the "Spray" of an old telescope, and observe the planets with it. Many of us are loners, aware of the fact that the world we knew has moved out from under us. Before long, most of us too will be "one with Nineveh and Tyre." We are doing something "fabulous but useless."

Science has moved on, as merchant ships moved on from the sailing vessels Slocum knew. It has become increasingly technical, discovery is now the purview of those equipped with highly sophisticated and expensive instruments who usually belong to large multi-specialty teams. The explosion of knowledge makes it impossible to keep up. And yet we may still take some comfort in the likes of Joshua Slocum—or the captains of the Mars-bound sailing vessels of telescopes like Schiaparelli and Lowell, Trouvelot and Antoniadi, Mayeda and Saheki and the rest.

After Slocum returned from his round-the-world voyage, he wrote: "If the Spray discovered no continents on her voyage, it may be that there were no continents to be discovered; she did not seek new worlds, or sail to powwow about the dangers of the seas.... To find one's way to lands already discovered is a good thing, and the Spray made the discovery that even the worst sea is not so terrible to a well-appointed ship. No king, no country, no treasury at all, was taxed for the voyage of the Spray, and she accomplished all she set out to do."

Slocum traveled around the world in a 37-foot sailboat. His fellow New Englander Henry David Thoreau (1817-1862) did even better: he roamed to the farthest ends of the universe without leaving his native Concord. Their tales—and those of the classical observers of Mars—remind us that the purpose of all voyages is the discoverer's finding out something in/about himself. The frontier is ultimately within, and ultimately personal. It may be, as Bruce Catton wrote in a review of *The Voyages of Joshua Slocum*, "nothing more than the conviction that if he searches long enough he can make the world give him something he has not yet had," or again, "the true voyage of discovery depends not so much on the new landfall that may be made, or on the perils met and surpassed along the way, but rather on what the captain himself has in his heart when the voyage begins."

But if that is true, the telescope will always beckon those with that certain something—the need to see, to work things out for oneself—in the heart of the voyager setting out. And the image of Mars in the telescope will always beckon to the captain manning the helm of that great voyage.

1. Gerard de Vaucouleurs, "Signal and Noise: The Slow Progress of Martian Studies." *The Graduate Journal*, volume VII, no. 1, Winter 1965, 181-193.

2. Richard J. McKim, William P. Sheehan, and Randall Rosenfeld, "Etienne Leopold Trouvelot and the planet-encircling martian dust storm of 1877," *Journal of the BAA*, **119**, 6 (2009), 349-350.

3. Thomas Dobbins and William Sheehan, "A retrospective on the tenth anniversary of the 2001 ALPO expedition," *The Strolling Astronomer*, **53**, 3 (September 2011), 24-37.

4. *The Voyages of Joshua Slocum*, collected and introduced by Walter Magnes Teller. Rutgers University Press, 1958. □

ISMO 11/12 Mars Note (8)

Trend of the Tharsis Orographics at Late Northern Spring

Christophe PELLIER

Around martian noon when the last strips of morning mists are dissipating, it is well known that very bright clouds form on the top of the Tharsis volcanoes (as well as above Elysium[1]). These clouds have been observed during aphelical apparitions long before they were found to be mountain's clouds by the space orbiters, and were called "W" clouds, or "domino's clouds" just because of the shape they were drawing in blue light images. The immediate post-opposition period of 2012 in late Martian northern spring has been good to watch them at their early maximum period (that is said to happen a bit later in early northern summer).

I - Orographic clouds

Clouds will form at the top of a mountain when a rising air mass on its flanks, while cooling, reaches a state where the air become saturated with relative humidity. The phenomenon is also common on the Earth. Usually, the ascending air develops the cloud before reaching the summit, and possibly stays above it, depending on conditions. Over the Tharsis volcanoes however, the situation is different: the orographic clouds form mainly *after* the air mass has passed the summit and develop on the lee side (side of the mountain opposing the direction of wind or downwind). The first figure is a high-res image of the afternoon orographic cloud over Olympus Mons taken by MGS in the middle of the martian northern summer of 1999 (so later in the season). The reason why the cloud over the Tharsis volcanoes at the 2012 season (late spring; ~λ= 080°/ 085°Ls) develop on the lee side has been given by M. Minami in the 3rd note of the old 1997 apparition: *"The orography is however different from the terrestrial case in the sense that the mountain is extraordinarily high (27km above the mean reference level) and so the summit works well as a heat source since the top of the volcano faces longer to the sunward to receive much more insolation. The upslope air is therefore not easily cooled, and so it must pass high up far the summit to become condensed on the lee side and may be in the very high altitudes*[2)]*."* So in conclusion here the clouds are geographically shifted from the summits themselves, and appear further to the west.

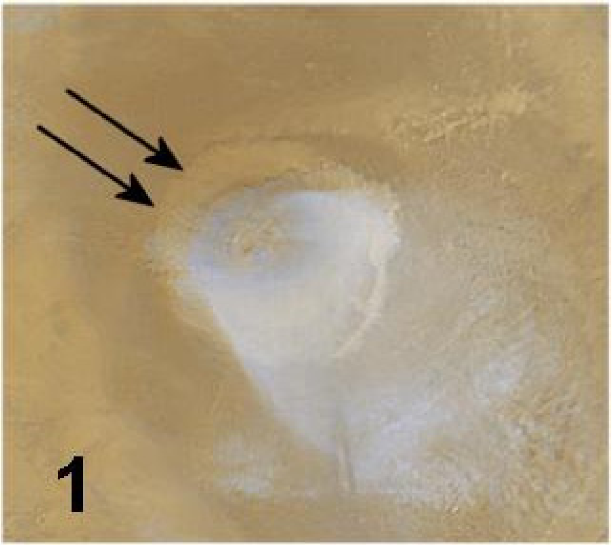


Fig.1: MGS image of the Olympus orographic cloud taken during northern summer. Exact Ls date is unknown (April 1999; ~λ= 120°Ls / 130°Ls). The arrows draw the direction of wind. The cloud develops over the caldera of Olympus and extends long over the lee side. As for the reason of the direction of wind see section IV below. © Malin SSS.

II - A decrease of cloud volume from north to south

The phenomenon affects the whole four volcanoes: Olympus (Om), Ascraeus (As), Pavonis (Pv) and Arsia (Ar). However, there are interesting differences of behaviour to pick up. It is clear for example that not all the four clouds are equal in importance. In particular, the three aligned clouds of As, Pv and Ar show an interesting decrease in volume from north to south; the most important (As, 11°N)) being located in the northern hemisphere, the second one over the equator (Pv, 1°N)) and the faintest of the three is found over the only southern volcano, Arsia Mons (9°S). See Fig. 2.

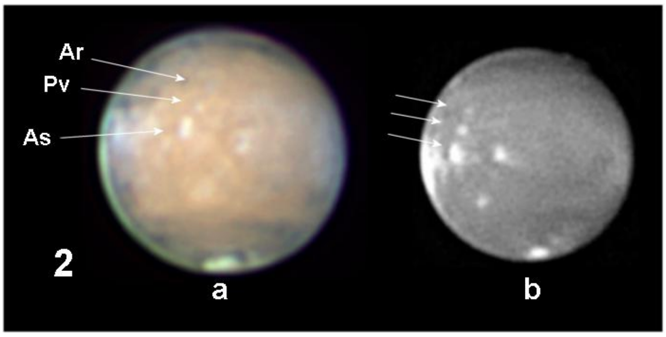


Fig. 2: The decreasing gradient of volume of the clouds from Ascraeus, Pavonis and Arsia. Images taken by Martin Lewis on 14th March (a: λ= 083°Ls, ω = 126°W) and in blue light by Jim Phillips on 21st March (b: λ= 086°Ls, ω=153°W).

It must be relatively easy to explain the difference. Differences brought by the topography do not look relevant as the three are relatively similar in height and size. So the available amount of water near a given mountain must explain the importance of its cloud. Ascraeus is located in the northern hemisphere, closer to the springtime polar water vapour source and at the very edge of the denser area of morning fog[3)], and is so necessarily the thickest. Located almost exactly at the equator, Pavonis already lacks similar water vapour sources. Farther away from those sources into the southern hemisphere, the Arsia cloud is logically the faintest of the three (moreover, if the springtime Hadley cell exists over Tharsis, its highest circulation part would be found over the immediate southern hemisphere, and would so not bring enough water vapour at ground level).

III - Local time of formation for each cloud

As usual, we can perform an analysis from the local Martian hour point of view to see if interesting things rise up. Figure 3 depicts the aspect of Tharsis from late morning hours to early afternoon. It gives the following table of results for late northern spring:

Volcano	LMH of cloud development
Ascraeus	10H-10H30
Olympus	10H-10H30
Pavonis	11H-11H30
Arsia	11H

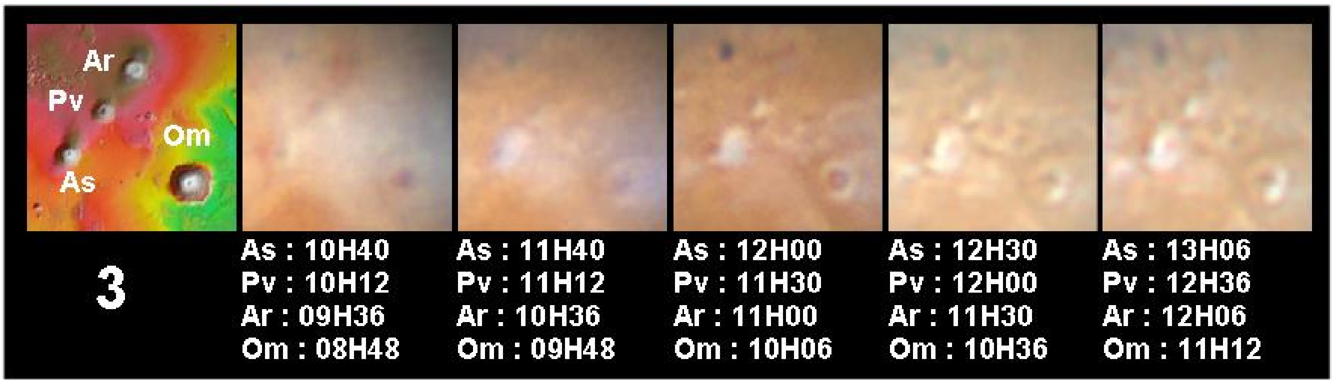


Fig. 3: Evolution of the Tharsis clouds around Martian noon. For each frame the LMH of each summit is indicated. Images from left to right Wayne Jaeschke (24 March), Emil Kraaikamp (15 March), Damian Peach (14 March) and Yann Le Gall (last two from 15 March). The encirclement of Olympus in the third frame is not due to clouds: the ground albedo of the circle around the caldera is responsible from for this effect.[4)]

The evolution is not perfectly linear from north to south but it looks that the orographic clouds from the northern volcanoes, Olympus and Ascraeus, develop around a gross hour earlier than the two others during the Sol. This is coherent with a higher amount of available water vapour in the northern hemisphere that would allow orographic clouds to grow slightly earlier. The precision of data looks not accurate enough to decide whether the earlier occurrence of the Arsia cloud in comparison with Pavonis is real or not.

IV - The trailing effect

Images taken in 2012 show that from noon to evening, the orographic show a tendency to develop westward, trailed by dominant winds. Figure 4 presents two images taken during mid-afternoon hours in Tharsis. The Olympus cloud shows the most impressive tail (see also Figure 1 above). The trailed cloud of Ascraeus is less easy to see but is well present. The effect over Pavonis is also visible but shorter, but not really over Arsia, and so we again see here a north to south decrease in importance. Measurements taken with WinJupos with *DPc*'s B image of Fig. 4 calculate an approximate length of 1000 km for both the Om and As clouds (the latter being longer, but fainter), and 500 to 600 km for Pv, half less or so.

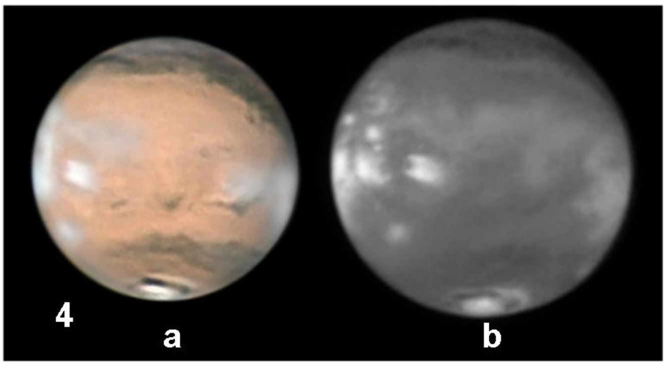


Fig. 4: The trailing effect on afternoon orographic clouds. Images from Don Parker (a: 17 March, λ= 084°Ls , ω=184°W) and Damian Peach (b: 11 March, λ= 082°Ls, ω=163°W).

Why is this effect visible? There are two possible reasons and they can both be linked and effective at the same time. The first reason is the existence of trade winds. Just like on the Earth, the return flow of the Hadley cell on the ground is deflected westward due to the rotation of the planet and the Coriolis effect. The descending branch being in the south hemisphere in late northern spring, the trade winds are orientated toward north-west; and we do see this direction clearly in the case of Olympus Mons (see Figs. 1 and 4). The other reason is an ascending effect of the Hadley cell, from the early afternoon regions towards the evening ones, as the first ones receive more heat from the Sun. This would also create westward dominant winds that would increase with the time. And the "trailing effect", do increase with the time as well (compare Figs. 4 and 3).

Why doesn't Arsia show the trailing effect? Its southern location must be the reason, either because trade winds do not affect its latitude, or because the afternoon longitudes in the autumn hemisphere are not heated enough to feed a cell of circulation that would create westward ground winds. But it might be as well just because the cloud is too small to develop a visible tail.

Conclusion

The trend of the Tharsis orographics in the season observed in 2012 (late northern spring, λ= 080°Ls-λ= 085°Ls) have the following proprieties:

- The clouds develop at late morning hours, the northern ones (Olympus and Ascraeus) around one hour earlier than Pavonis and Arsia, located further south
- A noticeable decrease in cloud volume from north to south is well visible, due to differences in available local amounts of water vapour
- A strong trailing effect due to trade winds and/or an afternoon to evening circulation cell affects Olympus, Ascraeus and Pavonis, but maybe not Arsia.

It will be interesting to watch for differences of behaviour of these clouds in the future apparitions when later seasons will be observable from Earth. In particular, in mid-northern summer after λ= 130°Ls, the "trailing effect" will disappear. However this would not be observable from Earth until 2016.

1) The trend of the Elysium cloud should be reviewed in a future note.
2) *"Clouds at the Tharsis Ridge and Olympus Mons, Morning and Evening"* M. Minami, CMO n°201, 25 March 1998. http://www.hida.kyoto-u.ac.jp/~cmo/cmomn0/97Note03.htm
3) See the last CMO/ISMO #405 Note, *"Bright Morning Radiation Fog inside Tharsis"*, by Ch. Pellier. http://www.hida.kyoto-u.ac.jp/~cmo/cmomn4/CMO405.pdf
4) Read the 4th note from the 2012 apparition *"Appearance of Olympus Mons with Aureole "* M. Minami, CMO #402 http://www.hida.kyoto-u.ac.jp/~cmo/cmomn4/CMO402.pdf

□

Letters to the Editor

●·····*Subject: article for next CMO/ISMO*
Received; 1 December 2012 at 04:29 JST

Dear Masatsugu, I have written the first part of an essay considering the question: what remains for the visual observer of Mars in an era of spacecraft surveillance.

I hope you will publish it in two parts, and I will write the second part in the near future.

Kind regards,

○····*Subject: night thoughts*
Received; 22 December 2012 at 02:19 JST

Dear Masatsugu and Reiichi, I appreciate the stimulating thoughts of Reiichi, and look forward to his essay, "the Areoholic Reconnaissance Global Union…" I think it offers a more optimistic assessment of the situation than my essay. I believe that reading about Masatsugu's and Takashi Nakajima's recent health problems forced me to consider the fact that they are not indestructible, and observers of that quality and longevity and dedication will be hard to find.

I have attached a (slightly retouched) version of the essay-I wrote it so fast I didn't have a chance to proofread it, but have made some corrections so that, if possible, this version should be published rather than the earlier one.

Perhaps for Part Two we could have a discussion of some of the points raised in the essay-or perhaps it would be Reiichi's essay that can carry this forward. All the best, yours,

○····*Subject: RE: We are looking forward to Part II*
Received; 30 December 2012 at 01:08 JST

Dear Masatsugu, We also have had a white Christmas here--the first for a number of years.

I was enjoying cross-country skiing (my endurance had improved after I started the medication Diltiazem for the atrial fibrillation), but unfortunately have come down with a severe head cold and so am taking it easy now as much as I can.

I am just now finishing the editing of the galley proofs of my brother's and my translation of James Lequeux's Le Verrier bio.

Yes, I have received interesting comments on my essay Christophe and Reiichi, and am glad to see the beginning of a conversation.

I wish you and your wife and family the best for the coming year, and especially for you, good health. Best,

Bill SHEEHAN (Willmar, MN, the USA)

(註; *Ed*) In the original version of Bill SHEEHAN's opening essay of this issue (Part II of Night Thoughts of a Classical Mars Observer), there was a confusion concerning the place of the glint spot observed by Shizuo MAYEDA on 4 June 1937. The very spot was at Sithonius L, but first described at Tithonius L. Really glint flares were observed at Tithonius L in 1951 (by SAHEKI), in 1958 (by TANABE), but the earlier observation of the flare checked by MAYEDA in 1937 was at Sithonius L. Bill SHEEHAN so communicated us as follows:

○····*Subject: RE: essay for CMO and ISMO*
Date; Sun, 20 Jan 2013 16:01:33 +0000

Dear Masatsugu,

It is my mistake--Sithonius Lacus was a site I did not know about. …

Perhaps we need to look into what the mineralogy of Sithonius Lacus is now. This will be a good project for our readers.

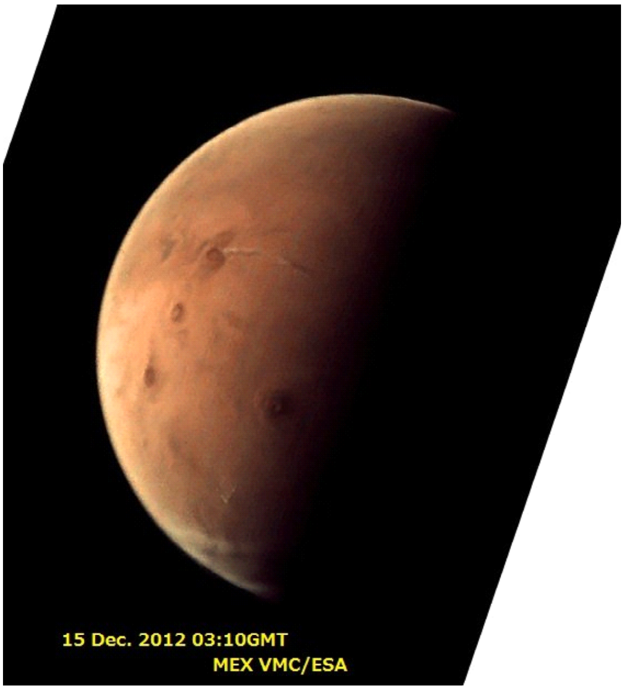
○····*Subject: RE: essay for CMO and ISMO*
Date; Sun, 20 Jan 2013 11:33:31 -0600

Dear Masatsugu,

I was in at my office-- returning home, I checked the draft of that article; it can be corrected if Tithonius Lacus is changed to Sithonius Lacus, and then if the "also" referring to Saheki's observation is deleted…(*Full versions will be cited in a coming issue*)

●·····*Subject: Arsia long cloud?*
Received; 19 December 2012 at 17:37 JST

Dear Dr. Minami, While Mars is nearing farthest across the sun, ESA's Mars Webcam's photostream



has finally come back today for which I have long been waiting. On the image attached here, long westward stream of cloud from Arsia Mons is seen which reminds me of the similar one reported by Mike Malaska years ago.

Best Regards,

○·····*Subject: RE: Arsia long cloud?*
Received; 20 December 2012 at 09:40 JST

Hi Christophe, Yes I believe this is a morning cloud just like the one observed by the MEX VMC on 2 July 2009 reported by Mike MALASKA:

http://webservices.esa.int/blog/post/6/785

This time it seems thinner but longer than the 2009 one. Best,

Reiichi KONNAÏ (Fukushima, JAPAN)

●·····*Subject: Re: Arsia long cloud?*
Received; 20 December 2012 at 08:12 JST

Woh that's very interesting Reiichi !

This is a morning cloud if I'm not mistaken ?

○····*Subject: Re: from bill sheehan text of essay*
Received; 26 December 2012 at 01:29 JST

Dear Bill, Reiichi, and Masatsugu, Thank you - and before everything, I hope that you are enjoying a nice Christmas !

First, there is something important to say I think. Even if at one point we consider that classical Mars observations (drawings) are obsolete, this does not mean by any way that the classical observers themselves, are obsolete....! I mean that you Bill, Masatsugu etc. you have a long and deep still interesting for anyone interesed in the observation of Mars. The different essays you have both published in CMO have not lost any value in that everyone can share this experience (not to talk about your books Bill).

You will then note that the "scientific obsolescence" is also true for modern CCD images; it strikes more earth-based observations than a kind of technique itself. The true question is, is it still possible to make science on Mars from the Earth?, and if I believe my experience at the EPSC, the answer looks to be no... as another experience of the planet that are example, over the last months I have been participating to the redaction of an article that will be published next year in "Experimental astronomy"; the aim of the paper is to collect every possible topics of cooperation between professionals and amateurs in planetary science. Each chapter is led by a professional with co-redaction from both amateurs and pros. Well, there is not even a chapter on Mars (the planets considered are Venus, Jupiter, Saturn, Uranus and Neptune). While I do share for example the scientific interest of some ideas worked by Masatsugu (he has written about them recently in the CMO) the amateur or earth-based size of science looks to be lost among modern scientists.

However, I'm always advocating the fact that "pure" science is not the only interesting level of knowledge. Modern scientific topics on Mars will be inaccessible for most of us. But there will ever be people observing Mars from the Earth and they will always need more or less basic information about the planet. Among the thousands of people (and still growing) that image the planet from the Earth, how many know everything about the clouds of Mars, the evolution of cap, everything about what we are writing in CMO? Very little I guess. My thoughts about the future of CMO/ISMO is that the review must play a key role here. And I have many ideas. Describing by detailed notes of observations the basic climate of the planet will assure at least still 10 to 15 years of publication, and people are always pleased to see that their images are useful for this (and there is a room for good drawings here). Now this would be my role and I hope that others will bring different contributions (this is already the case btw). Note that this level of information will not be found elsewhere than in publications by ISMO, SAF, BAA etc. Magazines of astronomy do not go as deep.

To say it shortly, the CMO/ISMO must play a central role of animation among amateur Mars observations.

A last remark about personal equations of observation. Yes of course, CCD observers have all their own equation bias (and it can be very quite a lot with time). The advantage of CCD is that the personal equation of one observer is perhaps more accessible to others (of course it's better here to have a personal experience of CCD).

If you have any remarks about all this...

Best wishes,

○····*Subject: On Next ISMO Note*
Received; 29 December 2012 at 19:48 JST

Dear Masatsugu, I have already began to work on the next ISMO note - it will deal with a analysis of the afternoon orographics in Tharsis.

Happy new year to you as well though we may say it again in a few days ;). Best wishes,

Christophe PELLIER (Nantes, FRANCE)

●·····*Subject: MERRY CHRISTMAS & HAPPY NEW YEAR 2013*
Received; 25 December 2012 at 17:07 JST

MERRY CHRISTMAS & HAPPY NEW YEAR 2013

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Giovanni A.QUARRA SACCO (Roma, ITALY)

●·····*Subject: Sam and Kieran*
Received; 27 December 2012 at 00:13 JST

Dear Masatsugu, I have been thinking about you, and it occurred to me that you might enjoy a photo of your old friend Sam and his grandson Kieran. David and Angelique picked an Irish name for their son, in spite of the fact that the only Irish thing about us is that we like potato soup. My family tree is English and American "tossed salad." I hope you like the photo.

My poet Robert Frost liked to say that the one sure thing about life is that it goes on.

We had a pleasant Christmas. My wife made a big and delicious meal, and relatives came to visit. I am still stuffed with the Christmas meal.

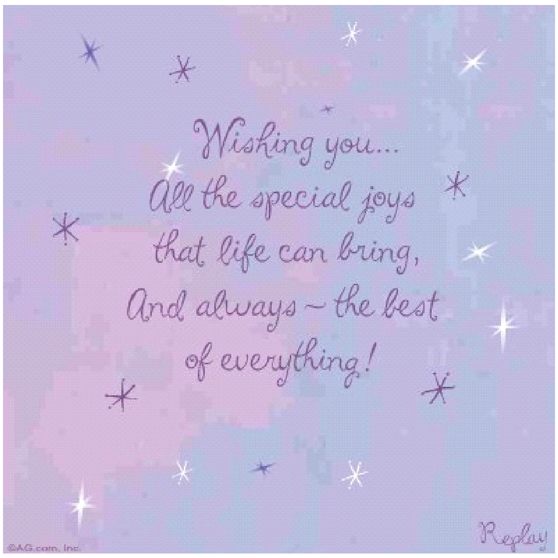
Best wishes to you and yours,

Samuel WHITBY (Hopewell, VA)

●·····*Subject: Donald Parker has sent you an ecard from AmericanGreetings.com*
Received; 1 January 2013 at 06:22 JST

Dear Masatsugu,

Happy Birthday and New Year. I hope that you are feeling better. My thoughts and prayers are always with you.



Best,

Don PARKER (Coral Gables, FL)

☆ ☆ ☆

TEN YEARS AGO (213)

---- CMO #268 (25 January 2003) pp3511~3534 ----

http://www.hida.kyoto-u.ac.jp/~cmo/cmohk/cmo268/index.htm

At the top page, there are found the greetings for the New Year and an announcement of the coming Lowell Conference: The latter was planned to be held in May 2004 at Anamidzu of the Noto peninsula where Percival LOWELL visited in 1889. The Conference Hall at Anamidzu was to be provided by the Kanazawa Institute of Technology (KIT) (especially thanks to the KIT President Toshiji KURODA, a friend of *Mn* for years), and also promised of the cooperation with the History Section of the OAA and the Lowell Society of Japan as well as the Toyama Yakumo Society (Yakumo is the Japanese name of Patrick Lafcadio HEARN). Participation of William Patrick SHEEHAN was also announced.

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COMMUNICATIONS IN 東亞天文學會『火星通信』since 1986

MARS No 268

25 January 2003

OBSERVATIONS Published by the OAA Mars Section

WITH BEST WISHES FOR THE 2003 APPARITION OF MARS

HAPPY NEW YEAR 2003

OAA MARS SECTION CMO EDITORS MINAMI, M MURAKAMI, M NAKAJIMA, T NISHITA, A AND TSUNEMACHI, H IN JANUARY 2003

お知らせ ---------------------------- Announcements

★『火星通信』では、2004年五月上旬に穴水町で「火星/ローエル会議」を開くべく、各方面と折衝していますが、幸いOAA歴史課や日本ローエル協会、富山八雲会その他からご協力が得られることになりましたので、正式に今年2003年度の課題として会議開催に向けて準備を本格化することと致しました。★待望の2003年の火星大接近は地上からの火星観測にいろいろな意味で一区切りを齎すものですが、古典的な観測についてその歴史を肯定的・否定的に振り返る好い機会かと思われます。特にローエルの謂うinterplanetaryなplanetologyの必要性や、彼が夢見たような分野を越えたcollaborationはこれから火星の観測手段が拡大するに連れて却って高まるかも知れません。★穴水は1889年にローエルが日本の辺境として訪れたところであり、荒山峠に立って彼が能登に馳せた眼差しは後に火星に向けた彼の想いと繋がるかも知れません。★会議では2003年の火星を広い立場で顧みると同時にローエルに深い想いを抱く人たちと交流を重ねたいと思います。詳しい日程·議題·討議事項などはこれからの問題ですが、会場は金沢工業大学(KIT)・穴水湾自然学苑の会議室及び宿泊設備をお借りすることになっています。★なお、今回の会議にはWilliam SHEEHAN氏が参加の意向を表明されていますし、更に、日本におけるローエル研究の第一人者OAA歴史課長の佐藤利男氏にもご賛同を頂きました。また地元穴水の坂下瓌氏(日本ローエル協会副会長)には早くからご支援ご鞭撻を頂戴しています。今後さらに多くの方にご指導を頂くことになると思いますが、読者の皆様にも更なるご支持・ご協力をお願いし、宜しく2004年五月の「火星/ローエル会議」をお忘れなく、予定をたててご参加頂きますようお願いいたします。

☆It is our pleasure to announce that we are going to hold a Conference on Mars/Lowell for a few days at the very beginning of May 2004 at Anamizu town, Ishikawa-ken, under the joint auspices of the OAA Historical Section, the Lowell Society of Japan, the Lafcadio Hearn Society of Toyama and other associations. We expect the presence of William SHEEHAN, and under his leadership we shall discuss the missed oppotunities of Lowell. We already opened our Lowell Page, and we shall continue to discuss the Lowell problem.

January 2003年正月 『火星通信』編集部 CMO/OAA Editors

3511

The third report of Mars at the season was given treating the period from the mid-December 2002 to 15 January 2003 when the Martian season proceeded from λ=109°Ls to 123°Ls. The apparent diameter of the planet was still small and just recorded from δ=4.3" to 4.9". The tilt was from φ=18°N down to 10°N. The phase angle was from ι=25° up to 31°.

The observers were recorded domestically five persons, and from abroad we heard from two observers. Damian PEACH (*DPc*) took several good images at Tenerife despite the small diameter, images made in LRGB and IR but scarcely in B. Domestically Yukio MORITA (*Mo*) took main markings in ccd. As the new year came in, Hiroshi ISHADOH (*Id*) began to observe.

http://www.hida.kyoto-u.ac.jp/~cmo/cmohk/2003repo/03/03.html

2001 Mars CMO Note (15) is about "Precursory Phenomena Leading to the Early Rise of the 2001 Yellow Cloud" which set forth at the unexpected early period λ=184°Ls. Here *Mn* discussed about it from the following precursory phenomena with the key word of water vapour: It may be related with 1) the two dust disturbances near Hellas as observed by the MGS at λ=143°Ls, 2) the possible interaction with the sph at around λ=162°Ls, and 3) a broad cloud band from the southern Hellas to M Tyrrhenum as observed by Don PARKER in G at λ=176°Ls. It was supposed that these phenomena increased the amount of the water vapour near the spc and eventually the atmospheric temperature was cause to rise early due to the opaqueness of the air.

http://www.hida.kyoto-u.ac.jp/~cmo/cmohk/268Note15/index.html

Great 2003 Mars Coming (7) was entitled "Watch the Inside of the South Polar Cap" and also persuaded the observers to check the appearance of the spc from the sph maybe before the southern spring equinox λ=180°Ls. After the period the thawing may rapidly proceed and a shadowy area could appear from the center of the spc. At around

λ=220°Ls, there could become to be observed constantly some dark rifts inside so that any should observe their directions and shapes. After λ=230°Ls the thawing effect could be unsymmetrical and the centre of the spc could deviate from the south pole. Another point to be check must be the appearance of Novus Mons. It is said that the period of λ=227°Ls must be the key.

http://www.hida.kyoto-u.ac.jp/~cmo/cmohk/coming2003/07.html

The LtEs were from Bill SHEEHAN (MN, the USA), David STRAUSS (MI, the USA), Mario FRASSATI (Italy), Nicolas BIVER (France), C H TSAI (Taiwan), Dave MOORE (AZ, the USA), Don PARKER (FL, the USA), Damian PEACH (the UK, at Tenerife), Randy TATUM (MN, the USA), Sam WHITBY (VA, the USA), Tom DOBBINS (OH, the USA), Ed GRAFTON (TX, the USA). Domestic LtEs were from T WAKUGAWA (Okinawa), S MURAYAMA (Tokyo), M NAKAJIMA (Yokohama), Y MORITA (Hiroshima),Y YABU (Shiga) J WATANABE (Tokyo), H ISHADOH (Okinawa), T HIKI (Nagano).

***Mk* wrote about in his series his experiences concerning Mt Fuji with a photo taken in the evening from his home.**

TYA#089 was written by HIKI (*Hk*) about CMO #127 (10 Jan 1993) and CMO #128 (25 Jan 1993). Twenty years ago, the planet Mars was at opposition on 8 January at Gem. Its maximal diameter was δ=14.9". During the period here reviewed, its season proceeded from λ=012°Ls to λ=026°Ls. 1992/93 CMO Note (4) reported the 2nd cooperated observations by the Japanese members which were held on 2, 3 and 4 January 1993. COMING 1992-93 Mars (4) showed several disks with grids which were made by A NISHITA (*Ns*).

In CMO #128 *Mn* wrote about his opinion that could deny the presence of the layer of the so-called violet clouds.

http://www.hida.kyoto-u.ac.jp/~cmo/cmomn1/Zure7.htm

M MURAKAMI and M MINAMI

International Society of the Mars Observers (ISMO)

Advisory Board: Donald PARKER, Christophe PELLIER, William SHEEHAN, and Tadashi ASADA, Reiichi KONNAÏ, Masatsugu MINAMI

Bulletin: Kasei-Tsûshin CMO (http://www.mars.dti.ne.jp/~cmo/ISMO.html)

CMO #406/ ISMO #32 (25 January 2013)

Editorial Board: Tadashi ASADA, Masatsugu MINAMI, Masami MURAKAMI, Takashi NAKAJIMA and Akinori NISHITA

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