POSSIBLE ALIEN ARTIFACTS IN THE KING'S VALLEY, LIBYA MONTES, MARS

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Abstract

The King's Valley on Mars is proposed to contain strong evidence for artificiality. Here the different formations are considered in turn, to present a complete overview of the valley. This also provides an a priori prediction, that on reimaging these formations will appear more not less artificial. It is important to assert this ahead of time as a falsifiable hypothesis. In many cases the geology of the formations is also falsified, that natural explanations do not suffice to explain them. The sheer number of possible artifacts in 5 kilometers of this valley is also proposed to be highly unlikely to occur by chance.

Keywords

King's Valley, Crowned Face, paleosea, Libya Montes, polar wander, lacustrine, fluvial.

Introduction

While the Crowned Face is best known, there are many other unusual formations in the King's Valley. In some areas it is difficult to find any part of the valley wall without a face of some kind on it. This paper shows some of these other features, artificiality is not proven with all of them as with the Crowned Face, but their proximity to each other makes them hard to explain. Other valleys in Libya Montes have no possible artifacts in them, these are all concentrated within five kilometers in one valley.

Libya Montes contains some of the oldest surviving Noachian terrain on Mars, it is also considered by astrobiologists to be one of the most likely areas to find life signs. This is because of the dense concentrations of dendritic valley networks indicating atmospheric precipitation and longitudinal valleys indicating groundwater. This also makes it more likely to contain artifacts, since the Noachian terrain dates back 3.8Ga to 2.8Ga this is when sentient life on Mars could have created these formations. It is likely the King's Valley adjoined a paleosea that appeared without a clear cause and then sublimated after around a billion years. To allow for this paleosea and precipitation the atmosphere would have been much thicker. It may then be that life had long enough to evolve to a rudimentary level of sentience shown by these formations. One hypothesis is this may all have happened by a chance shallow impact of the Argyre meteor on the pole at 3.8Ga. Another hypothesis is that aliens traveled to our solar system around 4 billion years ago to seed and terraform Mars with this same directed meteor impact, and perhaps the Earth as well. Our DNA might then have come from this original terraforming of Mars, or it could have evolved along with indigenous life on Mars. Rather than concentrating on only the best evidence the emphasis here is on completing the catalogue of formations in the King's Valley, building on a previous paper (1).

Methodology

The method used in this paper is to catalogue all the formations with prospects of being artificial. This necessarily makes the paper longer as there are so many, however they all need to be examined as part of this overall model of the valley. If someone created these then each one has a relationship to the others, for example there are five fish shapes which would be associated with an ecosystem in this paleosea. Each appears to be a different species, one seems to be a bottom feeding fish while another is pellagric like a reef fish. One appears to be eaten as the bones are showing through, they need then to be taken together to appreciate their significance. The recurrence of crown shaped faces represents a cohesive whole that is difficult to cut down in number, we do not know what is the most significant. For example, it might represent a succession of rulers, a tapestry of a time line of events, or separate artistic creations. This paper then is attempting to look at the big picture, rather than to pick and choose to create a possibly misleading interpretation. Some are more speculative, but predictions need to be made before this area is reimaged.

Entropy is also discussed as in [1], the creation of an artifact such as a face or fish carving must lower entropy. This is because if the terrain was formerly randomly eroded, then a sculptor would have arranged it according to a nonrandom design. Repetition also lowers entropy, the more often a common motif such as a crowned face appears the less random it would be. Leopold and Langbein [2] discuss this in terms of a river system, the King's Valley may also have been formed as a fluvial river, it may also be from sapping due to groundwater from the nearby paleosea. Entropy is expressed in terms of the probability of various states, so where a possible artifact is found in the valley it is a change in the overall entropy. Entropy also relates to the distribution of energy, usually a river system is formed by the increasing entropy as energy is dissipated by water running downhill. The most probable condition would then exist when energy in a river system is uniformly distributed subject to physical constraints like the kinds of rocks that may erode at different rates. This is seen in the other fluvial valleys in Libya Montes [Fig.4]. The most probable state of the valley walls would be random with higher entropy; fluvial and Aeolian erosion increases this entropy by breaking up repetitive patterns. In the King's Valley a repetition of patterns indicates lower entropy, a valley full of faces would be expected to erode away into random patterns. It follows that higher entropy should not be increasing the number of crowned faces or making them more similar to each other.

This area has been intensively investigated by planetary scientists in recent years. Erkeling et al. [3] discuss fluvial landforms, paleolakes and possible shorelines close to the King's Valley. They say a complex hydrological cycle could have existed between 3.7 and 3.1 billion years ago in this area. It is proposed the King's Valley was associated with sentient life at that time. One hypothesis [4] is that aliens terraformed Mars and seeded it, and perhaps the Earth, with life at that time. This can give a possible explanation for many of the water related evidence from that time. Another is that this life evolved indigenously because of this long lived paleosea of over a billion years. Erkeling et al [5] suggest lake sized ponding and an alluvial delta in this area. Because of the triple point of water this could only have occurred with a much thicker atmosphere, hence the suggestions that at least primitive life could have existed at this time. In [Fig. 1] below the King's Valley is on the left hand vertical side of the red box.

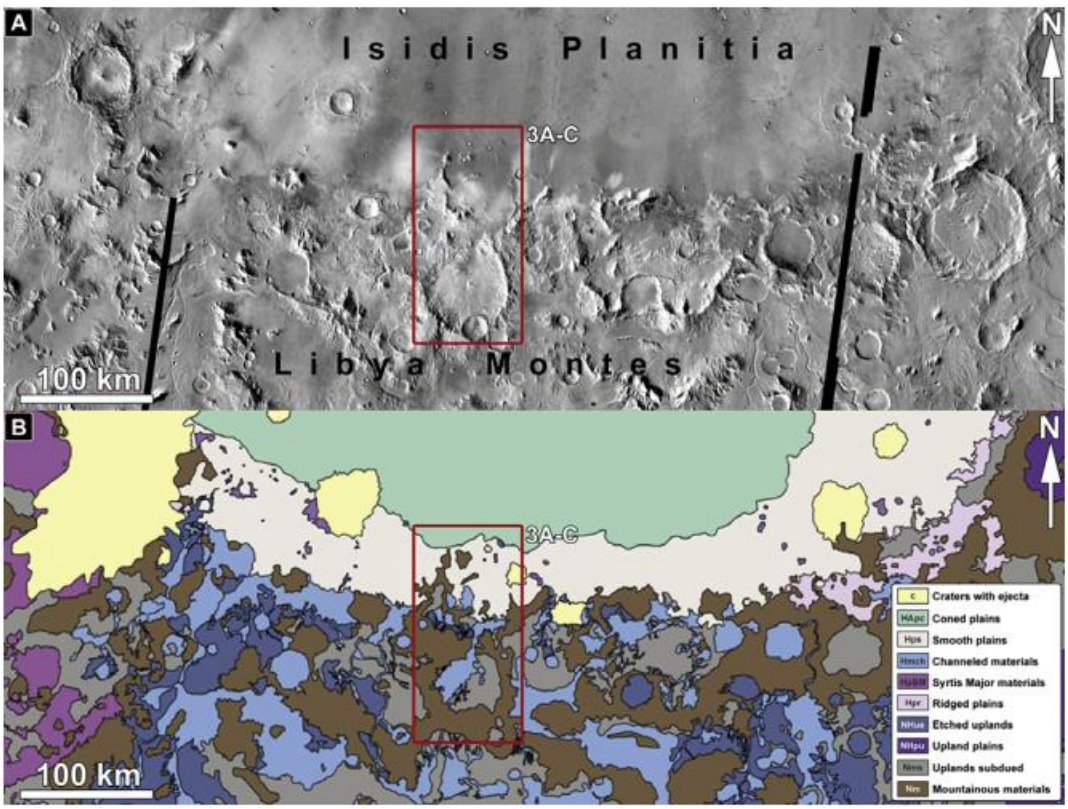

Figure 1. The King's Valley is on the left edge of this box.

In [Fig. 2] below is shown a paleolake, Erkaling et al. [3] propose it was connected to the paleosea in the Isidis Basin. The King's Valley is close to this, about the width of the terrain shown to the left of this image. It was then likely to have had close contact to this paleosea, including groundwater. The main debate in astrobiology today is not whether there was life on Mars at this time, many planetary scientists think this is possible, but whether it could have been intelligent enough to build these formations. We tend to equate this possibility to whether life could have evolved on the Earth in so short a time, but there is no way to assess this. As will be shown, the possible artifacts in the King's Valley include 5 different kinds of fish on the valley walls. The hypothesis of a paleosea nearby then may connect to this evidence of fish that lived in that sea, and presumably were part of a food chain these creatures lived on.

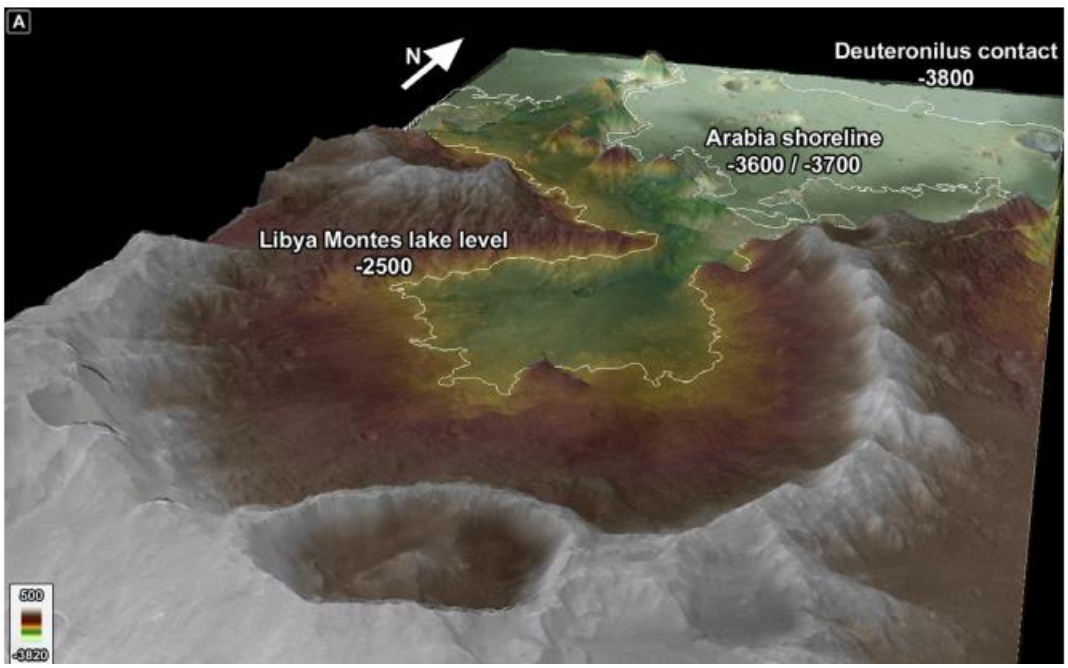

Figure 2. This lake is adjacent to the King's Valley

Ivanov et al. [5] suggest these fluvial and glacial processes occurred in the Early Hesperian to early Amazonian or 3.8 to 2.8 billion years ago. Jaumann et al. [6] examine this area with regard to the evolution of life. Figure 3 shows how they consider Libya Montes to be of particular interest for life signs because it has phyllosilicates, fluvial valleys such as the King's Valley and the paleosea in Isidis Planitia. They also suggest that paleolakes [Fig. 2] are privileged targets in the search for life there. Phyllosilicates indicate the alteration of minerals by liquid water in this area. They also say these are good targets to look for organic materials, as pointed out this is next to the King's Valley. Tectonic, Aeolian and glacial processes were examined by them and were considered to be insufficient to account for the probable shoreline near the King's Valley.

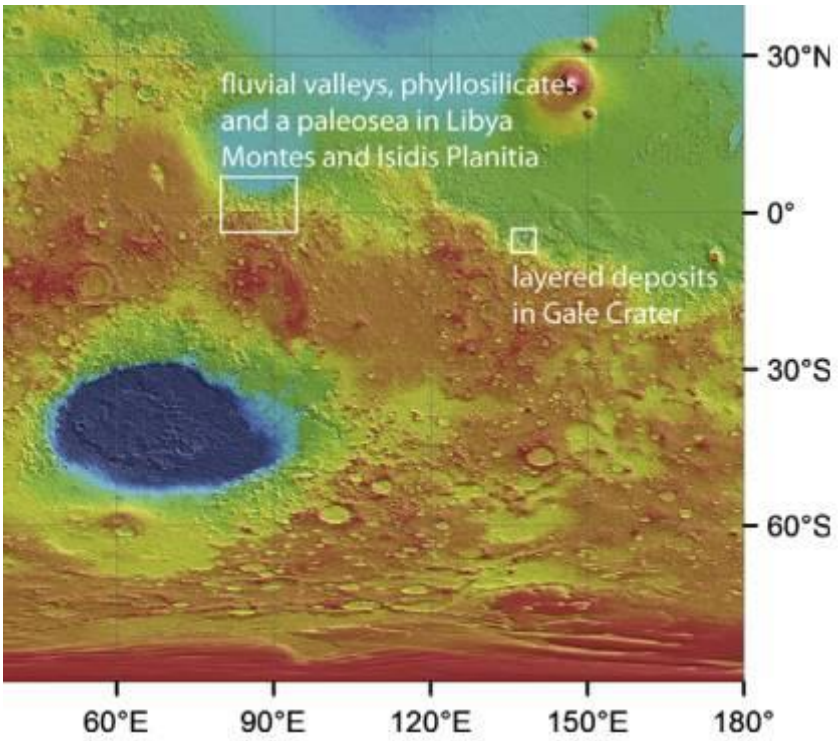

Figure 3. The paleosea and fluvial valleys in Libya Montes.

Erkaling et al [7] suggest this paleosea in the Isidis Basin was short lived and then sublimated to be deposited at the poles. It was suggested in [4] that Mars was terraformed by shallow impacts directed at the poles at that time, the South Pole was in the current position of Tharsis Montes and the North Pole was north of and perhaps overlapping into Isidis Basin. Sprenke and Baker [8] shows these approximate positions and the possible polar wander that would have followed. This terraforming could have been intentional or simply a lucky accident, a shallow impact at Argyre Crater directed at the edge of the pole at Tharsis would have spread the shock wave across the pole, melting it while creating volcanoes and directing the water down a former chasma that became Valles Marineris. Erkaling et al [3] suggest that Chryse and Amazonis also had paleoseas, they would in this impact hypothesis have been formed by the melting of the South Pole around Tharsis Montes by the Argyre impact crater. They also say that wave action appears to have cut the cliffs of Libya Montes along its paleoshore, it indicates the paleosea was large and there was enough air pressure to produce wind to create these waves.

By antipodal volcanism, the South Pole is proposed to have been melted forming this paleosea in Isidis Basin. Antipodal volcanism from the Argyre impact then may have formed Elysium Mons, Hecates Tholus, and Albor Tholus melting this North Pole. The second hypothesis is a shallow meteor impact directed at this North Pole, from Isidis Crater or Amazonis Planitia, created the Elysium Highlands like the Argyre impact would have created Tharsis Montes. A single impact could then have caused all this by chance, two impacts at the poles simultaneously is unlikely enough to imply the terraforming hypothesis.

The existence of these volcanoes on the poles would have thickened the atmosphere, and kept the paleoseas liquid for a long time until they eventually sublimated as the poles wandered. More of this hypothesis is explained in [4], it also is a possible way we could terraform Mars with similar impacts at the current poles also explained in the book. The short length of time in which this sea appeared and then sublimated is part of this overall hypothesis of the impact creating these paleoseas. If enough frozen air remains at the poles, then similar shallow impacts could melt the current North pole to refill part of the Northern Lowlands. A similar impact could fill the Prometheus Basin around the current South Pole, perhaps also Hellas Basin. It might even create paleoseas that lasted as long as they did then, this would be more than enough for a colonization of Mars by us.

Soucek et al. [9] suggest that Isidis was filled by a large ice sheet, this may have been from the pole there at the time. They say this ice sheet could have existed when the air pressure was low, the King's valley and similar valley networks in the area could then have been associated with eskers and tunnel valleys draining this water outwards. A pole would be consistent with this ice sheet, it would then have melted into a paleosea for up to a billion years and then sublimated to the poles. The hypothesized impact could then have created this paleosea from a pole, and then the water would have sublimated to a different polar area after polar wander. Guidat et al. [10] also suggest this ice sheet existed, the thumbprint terrain of arcuate ridges and cone fields in Isidis Basin is named for its resemblance to fingerprints. In the terraforming hypothesis, the single Argyre impact would have melted the base of this ice sheet from more diffuse antipodal volcanism, also allowing meltwater to drain outwards. Eventually this became the paleosea, this melting would have been assisted by the formation of Elysium Mons close to it. When Elysium Mons cooled sufficiently then this may have led to the paleosea freezing then sublimating to the new poles.

It is suggested [4] that the pole in Isidis Basin migrated eastward then northward to its current position, the pole at Tharsis Montes would then have migrated eastward then southward to the current South Pole position. This polar wander may have happened while Tharsis Montes and Elysium Mons maintained these paleoseas, the existence of possible artifacts on a great circle like an equator implies this South Pole may have stopped west of Hellas for a long period. As these volcanoes cooled then most life in the King's Valley area, whether it evolved indigenously or was introduced, would have been extinguished. As the atmosphere froze at the poles this would have preserved the possible artifacts over these billions of years in a near vacuum.

Erkaling et al. (7) discuss how these fluvial valleys In Libya Montes flowed into this paleosea [Fig. 4]. The King's Valley then was likely formed at this time.

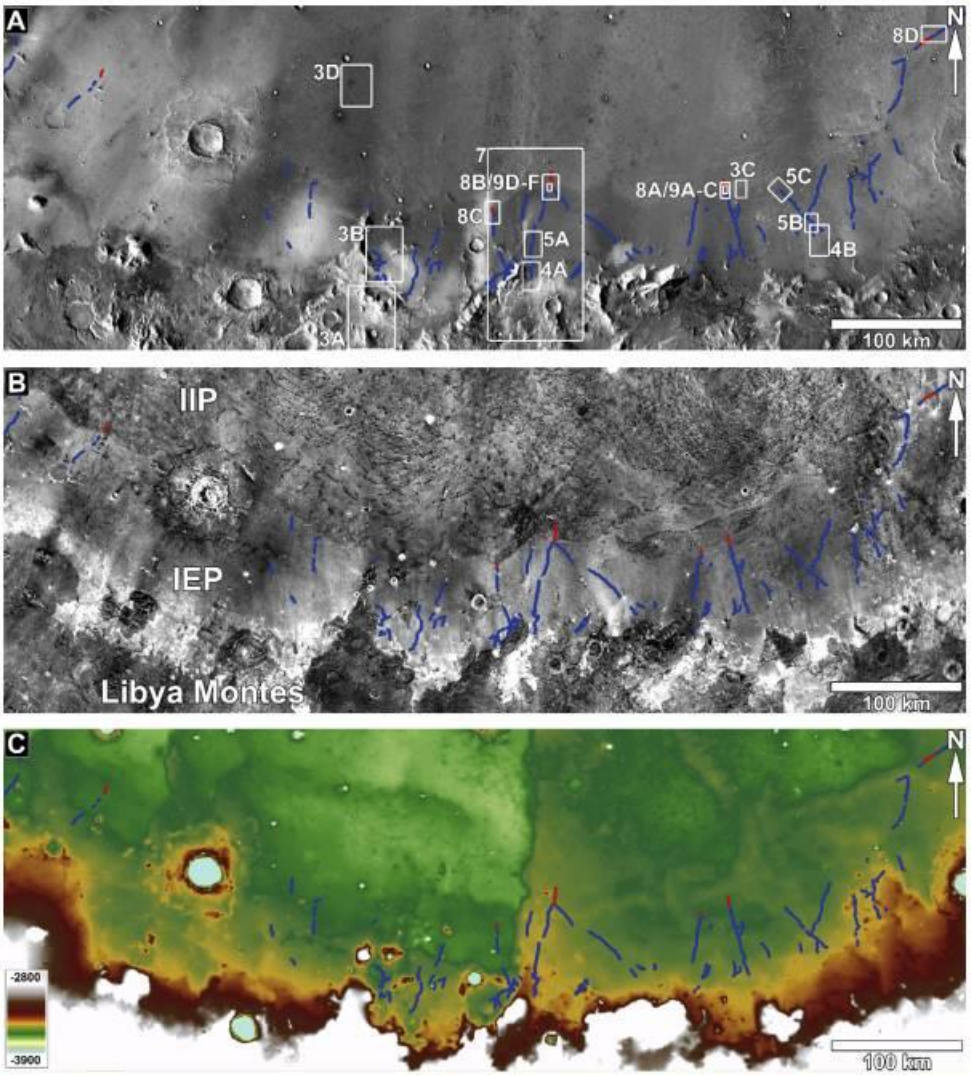

Figure 4. The edge of this paleosea with fluvial valleys, one of these is the King's Valley.

Crumpler and Tanaka [11] say these Noachian highlands contain one of the highest densities of valley networks on Mars. Because this is one of the oldest and lowest areas identified on Mars the sedimentary material here dates to the earliest Martian history. It may be significant then that the best evidence for artifacts on Mars is in an area better preserved. Many cycles of fluvial activity would have occurred here, such as rain or higher groundwater causing fans of sedimentary debris to be deposited into Isidis Basin. Because this valley was likely formed by groundwater it would be better preserved than if it was part of a dendritic fluvial valley subject to cycles of flooding. They examine part of the King's Valley [Fig. 5]. The Crowned Face is just to the right in this image.

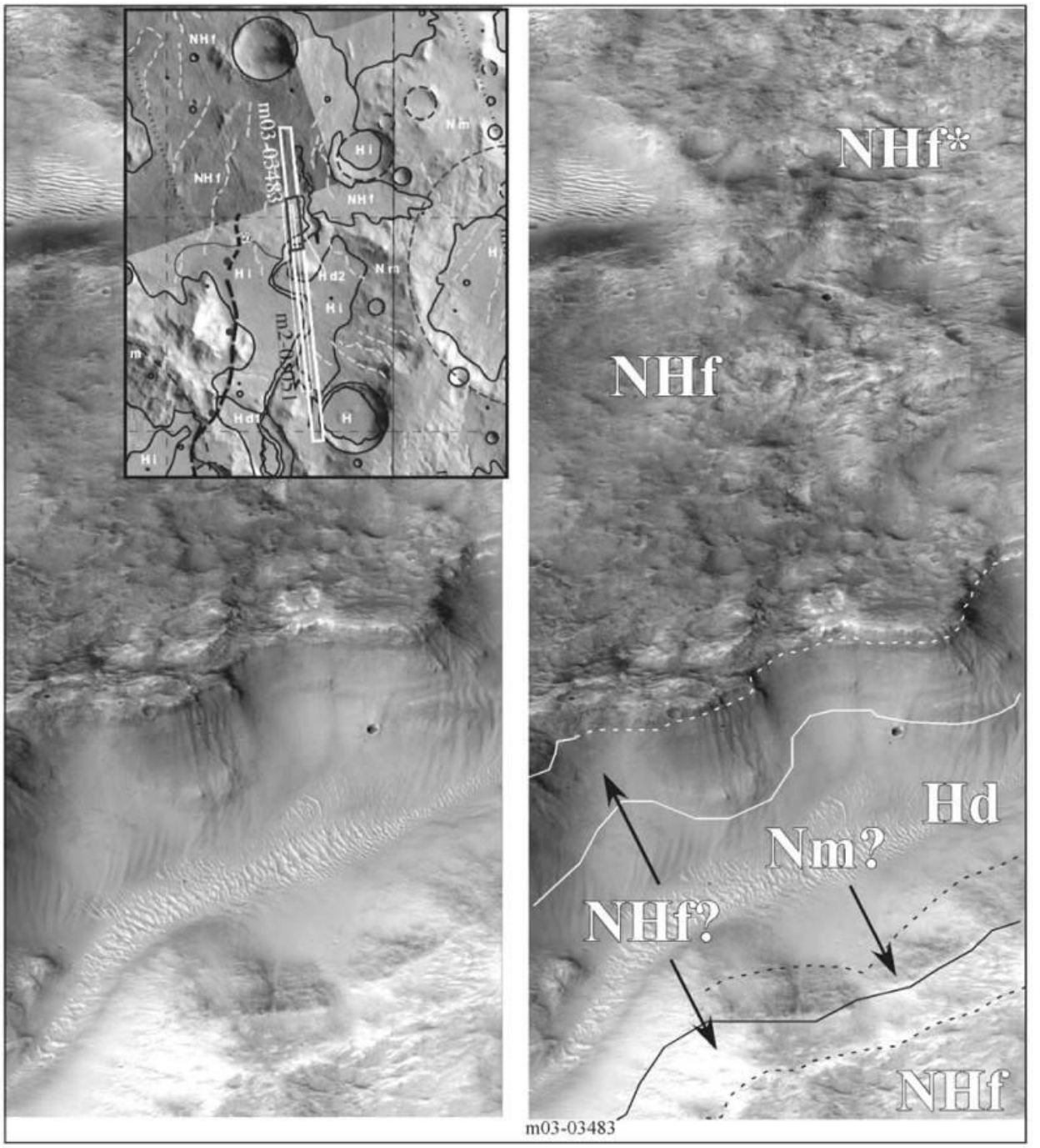

Figure 5. The King's Valley.

Erkaling et al. [12] refer to dendritic valley networks that suggest atmospheric precipitation while longitudinal valleys would be formed more by groundwater. It is likely then at this time the King's Valley was formed by groundwater because of this lack of dendritic tributaries. Having rain in the area also supports the hypothesis of sentient life either evolving here or being introduced. Because this paleosea lasted perhaps a billion years it is possible sentient life managed to evolve. In this case the Argyre impact may have accidentally spurred the evolution of more primitive life by chance, then this sentient life died out before it could acquire enough technological ability to survive the cooling of Mars. In [4] it is described how all these changes on Mars could have occurred with a single shallow impact creating Argyre Crater. If this was by accident rather than design, then there would be no alien visitation associated with these formations. Erkaling et al. [12] also refer to this as one of the oldest areas of Mars, this may be why these formations survived rather than being destroyed by volcanism as in so many other areas.

A geological summary

As has been shown, the King's Valley probably abutted a paleosea for up to a billion years. It is considered to be one of the areas most likely to have had life if it existed on Mars at this time. This is because of the high concentration of fluvial valleys in the area. It is also suggested that at the time there was atmospheric precipitation or rain, also that groundwater would have connected these valleys to the paleosea. It is also consistent with this paleosea appearing and then sublimating to the poles, this would have happened with the hypothesis on either aliens terraforming Mars or this happening by an accidental impact. The area is also one of the oldest on Mars and so is more likely to have had possible artifacts survive there.

Entropy and degrees of freedom

A controversial subject like this is difficult to prove. It is important then to understand the methodology followed here. Pareidolia is often raised as an objection, that people see faces in clouds and so if people look at enough Mars images they will find faces there too. In some cases this can be true, however if there are legitimate artifacts on Mars it would be a tragedy to dismiss them on the basis of this argument. The concept of entropy is related to probability and degrees of freedom. Generally, the higher the entropy the more random Martian terrain would be, this would be seen in highly eroded areas for example. Conversely low entropy is seen where patterns are repeated, if there are many fluvial valleys in Libya Montes this is low entropy because they are similar to each other. Said in another way the degrees of freedom statistically are lower because valley networks have less freedom to change and still be regarded as having been created by fluvial processes. Low entropy represents an ordered structure and a repetition of similar patterns, these are broken up by erosion over time so the terrain increases in entropy.

In the same way then the King's Valley is examined in terms of its low entropy and degrees of freedom. It is not so important then how high the quality of evidence is for an individual formation because if random these should all be independent variables. Because of this the odds against chance multiply together rather than add or average. Seeing one crowned face in a cloud or a valley then might be from random chance, seeing many crowned faces over and over in one cloud or valley is of much lower entropy and degrees of freedom. This is because faces seen like this are generally very different to each other, this allows for more degrees of freedom and so they can happen more often by chance.

The concentration of these formations is another degree of freedom, if they were random then they should be scattered all over Mars. However, the main formations here are packed into only 5 kilometers of one valley, this contains more evidence of artificiality than the rest of Mars put together. Not included here are the contents of [1] which contains much more evidence of crowned faces, it should be read in conjunction with this paper. Since the circumference of Mars is 3,397 kilometers 5 kilometers represents about .15% of this distance. Some might object that there could be other concentrations of faces not yet seen, however I have personally looked at all the Mars Orbital Camera and HiRise images without seeing them. Mars is also well known for sensational claims of animals, skulls, sculptures, etc in the Rover images. This has also occurred with HiRise and Mars Orbiter Camera images, but not even the most sensational claims have been concentrated in one area like this. There is nothing special about one small valley having crowned faces all over it from geological processes and then the same processes not forming them in any other valley on Mars. This should be apparent to any geologist, there are many fluvial valleys even in Libya Montes but only one has these possible artifacts. There is not sufficient room here to demonstrate this, however the author has looked at all the other valleys in Libya Montes without finding a single possible artifact.

The possible artifacts in the King's Valley and in some areas of Mars display low entropy, they conform to a narrow range of possibilities that keeps repeating like a motif or theme. This it is suggested falsifies the pareidolia or null hypothesis. The four main areas of possible artifacts are situated on a great circle like a former equator, this would correspond to a South Pole known to have existed west of Hellas Crater. More is explained on this in [4]. In the King's Valley the faces are similar to each other, nearly all have a crown shape which reduces the degrees of freedom to having different kinds of hats for example. The faces are also similar looking to each other, in [4] this was shown with an overlay of the 3 main crowned faces onto each other, and 2 other faces called the Meridiani Face and the Cydonia Face. The similarity is very high and the probabilities against chance were estimated to be astronomically large. There is then a consistent trend where degrees of freedom are not found, instead there is the same or similar face with a crown found over and over.

It is comparing this low entropy that the evidence should be viewed, not in taking each formation individually as this is not an accurate statistical method. A common problem seems to be the preconceptions of the reader, if aliens visited Mars then these faces are not the kind of evidence these people expected to be found. This attitude is particularly strong in the opposition to finding faces, in part because of the claims of pareidolia, and also because they would have preferred a geometric message. But we cannot decide what aliens or indigenous Martians should have done 4 billion years ago to attract our attention. We have this evidence and must evaluate it on its own terms.

Pareidolia

Liu et al. [13] conduct an experiment where the subjects see faces in random noise. However, this is not the same as the King's Valley because the same motifs repeat over and over there. If these subjects were shown one face, and then asked to see when they saw something similar to that face only, then this experiment would be very unlikely to succeed. This is because by random chance a similar shape would not recur often enough. With letter pareidolia this is where alphabetic letters are seen. But if the subjects were asked to look only for the letter A in Times in New Roman then they would not see it often, in the same way the repetition of a very small range of artifact shapes is less likely to be pareidolia. It is then the similarities between these formations which is used to falsify the pareidolia hypothesis. This point seems to be the hardest for readers to understand, the idea of faces in clouds is obvious and researchers generally can tell when a formation is fanciful like this. The problem is that there are common motifs that are connecting over time into a comprehensive model of a previous civilization of some kind.

Di Lazzaro et al. [14] discuss the brain's ability to form images in low light conditions, however the faces and other formations in the King's Valley are well lit with high levels of contrast. It is indeed possible to see things on Mars that don't exist, this can be done by using pixilated or fuzzy images. It can also occur from software compression of images where this introduces defects from the JPEG compression process using Fourier Transforms. This can all be avoided by only examining larger formations that are not ambiguous like this. Also, finding inscriptions in their experiment is a process with an infinite number of degrees of freedom, any significant shape can be included as a discovery. By contrast the King's Valley is showing a repetition of the same motifs over and over. If they were all different enough from each other, then this could be easily dismissed as pareidolia.

Nearly all have some kind of crown and the faces are similar enough to be all of the same creature. There is only one without a hat, this is found in the recent HiRise images and is called the Sculptor. This difference in the headdress may be because they represent the creators of these formations. The only other formations that are different are five fish shapes, these are also similar enough to be recognized as fish. There may be some variation of species being depicted, however there need not have been an intention of repeating the same fish shape. It is fortunate that for some reason the crowned face seems to be so similar as to be the same creature over and over, this reduces the chances for pareidolia to explain them. It should be emphasized however that these possible artifacts are probably not a message to anyone, but would have been made for the local inhabitants. That they convey a message poorly, or are not what we expected is the same as for any archeological site.

Sheen and Jordan [15] also discuss this pareidolia in the Shroud of Turin. However, the variations in the cloth give rise to these illusions, some defects in the weave for example might appear to be insects. In the King's Valley however, any such defects would be very small by comparison to these faces. A clumping of pixels might look like an insect as they found, some have proposed insects like this can be seen in Mars Rover images. But this is another example of open ended looking for anything significant, with so many degrees of freedom small objects will eventually look like something recognizable. They don't look like crowned faces and these formations are far too large for chance rock formations to look like them. Saunders et al. [16] also discuss formations in the King's Valley.

A crown shaped depression

This first feature in [Fig. 6] has a basic face like shape with a flat top like a crown, this is found to the right of the Crowned Face and has a similar outline to the Cydonia Face. Being a crowned shape its location in the King's Valley makes it worth examining, the more similar motifs like flat tops or crowns are observed the less this is likely to be by random chance. There is a possible dark right eye and mouth, these are very unclear but are pointed out as a prediction. If this is a real face shape then later images at higher resolution should see facial features, unless they are eroded away. When the features in this paper are unclear they should be considered as predictions on this basis.

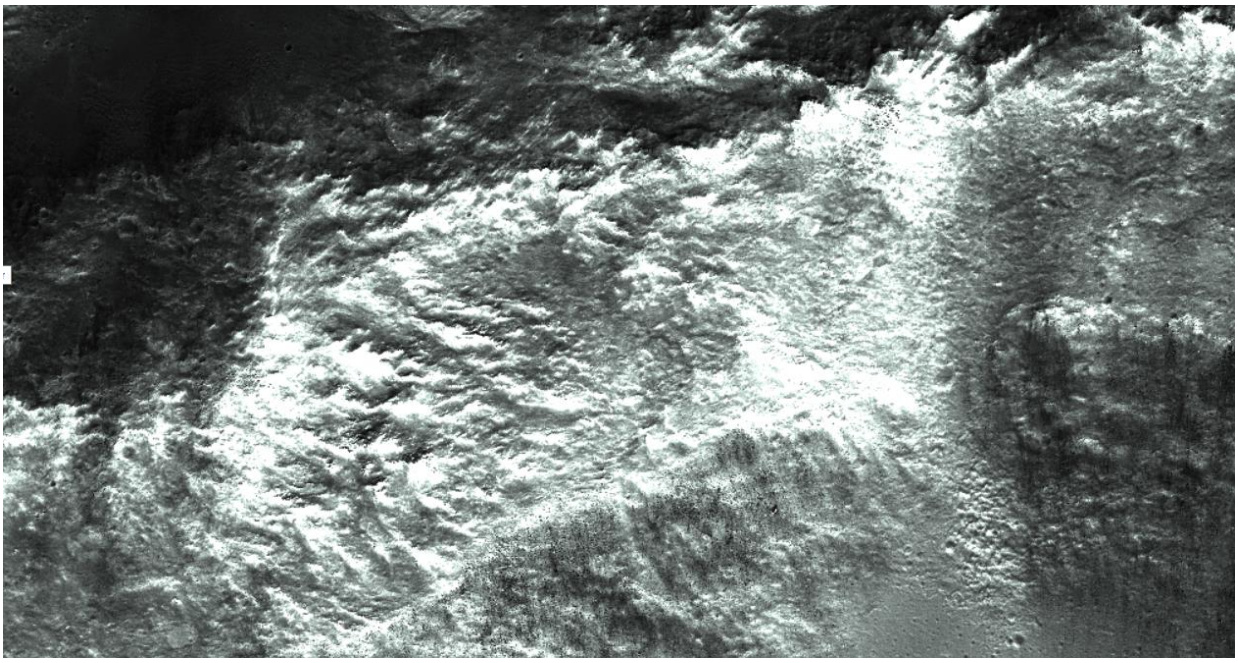

Figure 6. Crown shaped depression.

This shows a close-up of the shape [Fig. 7], it is nearly completely buried in dunes so features are hard to see. These dunes seem to be also shaped by the rounded jaw line on the left. On the right there are no lighter areas of soil until outside the shape. Later there is another shape [Fig. 23] called the Shield Face, another similar shape in the King's Valley is shown [Fig. 76]. It is then a recurring motif.

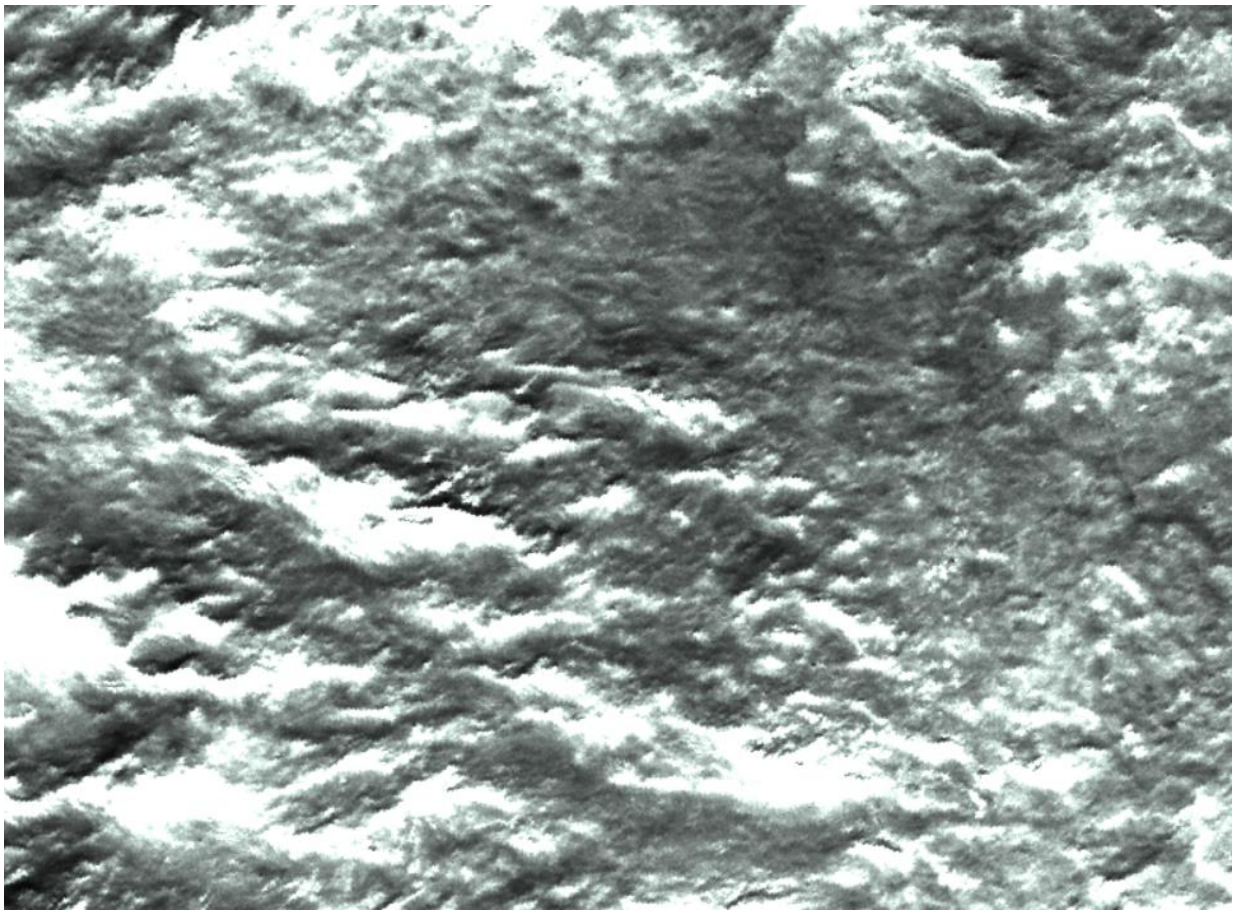

Figure 7. Close-up of the crowned shape.

In [Fig. 8] there is the outline, possibly of one eye and a mouth. These are very unclear; however, they represent a useful prediction for when this is reimaged. The main point is that the shape is not like a known natural formation, it is not a crater as they are round or elliptical. Dunes around it form random shapes or are aligned at right angles to the wind which would have come from the left. When the dunes hit the left edge of this shape their movement to the right was altered as shown. The sides and crown shape are approximately straight and the bottom of the face is an arc, similar to the Cydonia Face.

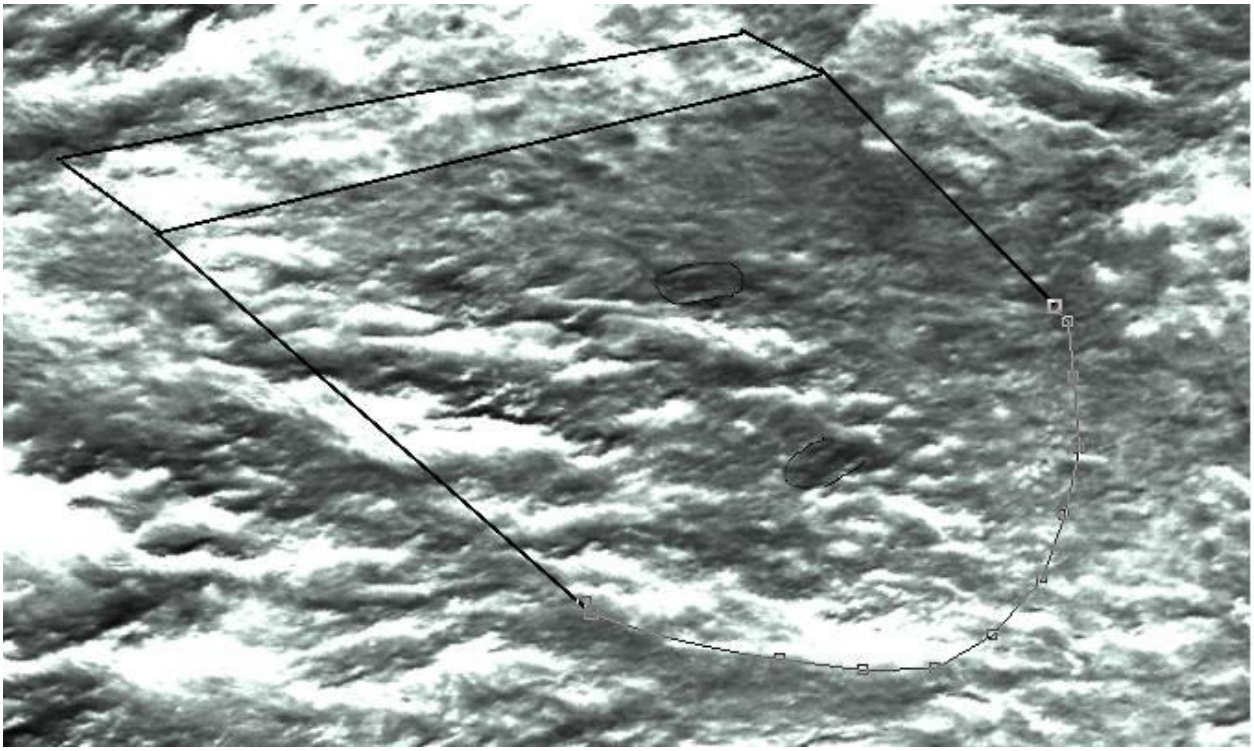

Figure 8. Outline of the crowned depression.

A partial face

In [Fig. 9] there is a partial face shape, to the right it is like the pale layer of rock has disappeared or perhaps lost its pale coating. This is unusual because if this layer is gone, it has not turned to dust. If the pale coating has disappeared so completely then a geological formation should not have a coating like this. If it was light sand then it should be to the right, this is the direction that dunes appear to be moving in the valley.

It may then have been made of mud and washed away, some of these features may have been made of highly erodible materials. The edges are quite sharp and the pale areas seem much higher. The face remaining is similar to others in the King's Valley, the vertical lines on the chin appear to be from dunes. The mouth is quite clear and in the right position. There are also two jagged pieces of this pale material extending to the right, one to the right of the nose and the other to the right of the chin. There is a strong impression of the material to the right disappearing or collapsing.

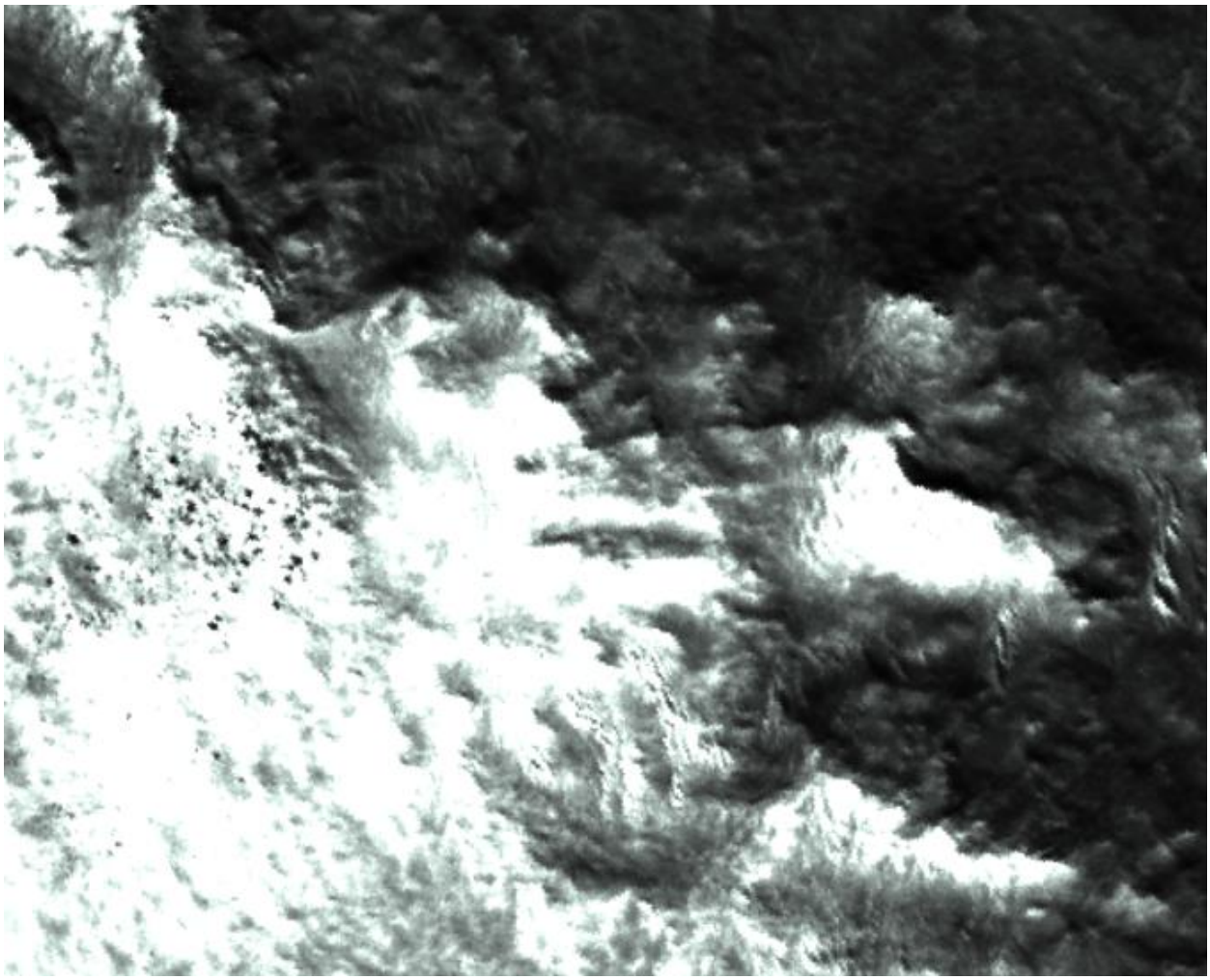

Figure 9. Partial Face shape.

In [Fig. 10] below there is the shape of an eye in the right position at B, this would need to be confirmed when reimaged. A shows the left eye. C shows a dark area like the right side of the face. D shows the end of the nose or perhaps nostrils. E shows the mouth. F shows the vertical dunes on the chin shape. G shows the left side of the face which follows a line of shadows. To the left of the dark area goes up at an angle like a typical crown shape in the valley, if a crown was excluded from the terrain then this would partially falsify the repeated motif of another crowned face. Nearly all have some form of crown with the exception of the Sculptor and the Coin Face seen later. Both of these are much smaller and may relate to the creator of these sculptures.

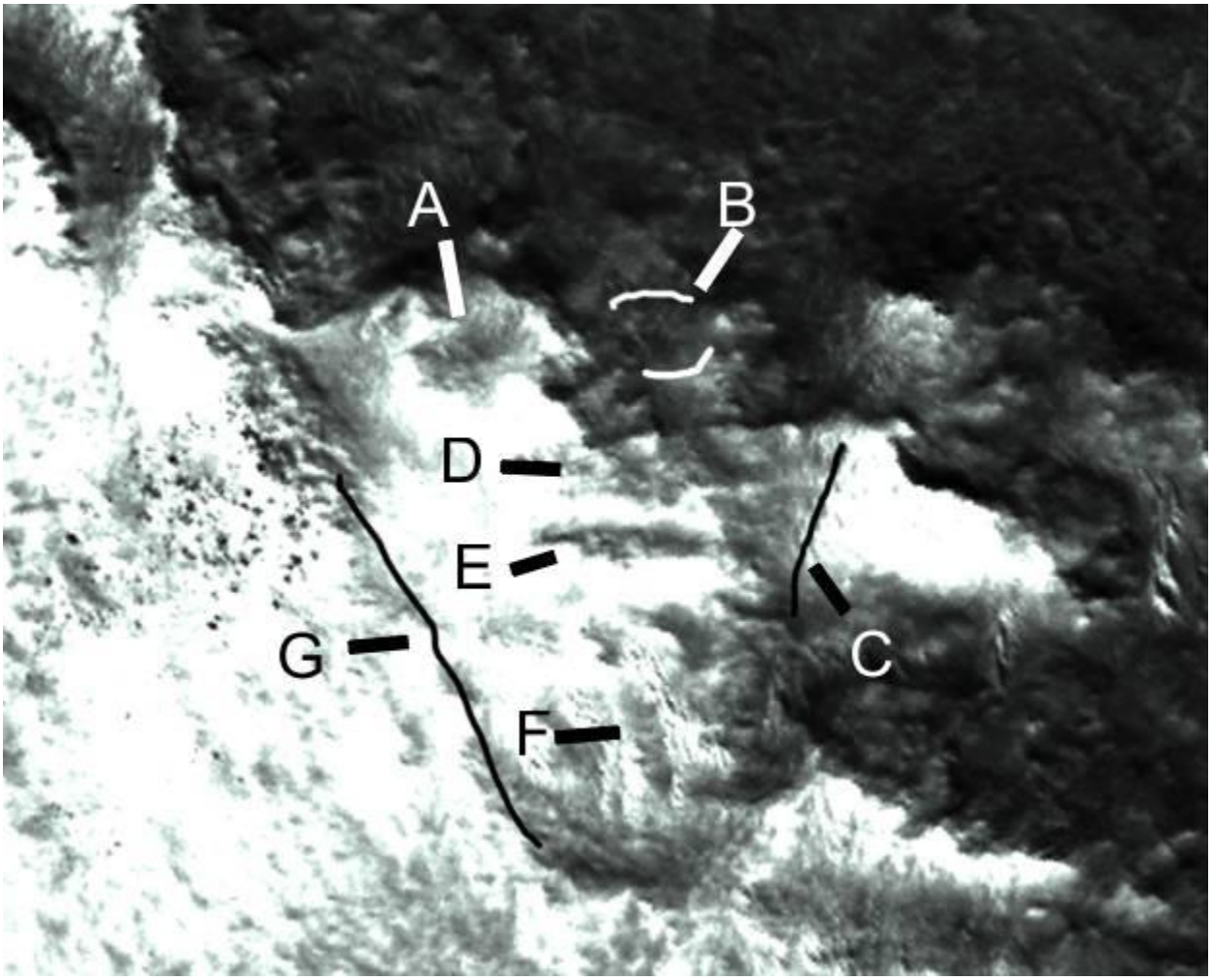

Figure 10. Annotations of the Partial Face.

A more ambiguous face

This formation [Fig. 11] was shown in [4] from the Mars Orbital Camera image, it may well be pareidolia with an unusual jaw and nose. It remains ambiguous, with higher magnification it retains the same shape but is different from the other faces and has no crown. It is likely then to be an example of pareidolia, seeing faces in random patterns. The open mouth is also different from the other faces; it may however be a highly-eroded face that looks different now. When someone looked at the Crowned Face from the opposite side of the valley, on Wall 2, they would see this face almost directly behind it. Some of the faces shown here then are better than others, there is no attempt to cherry pick the best evidence. This is to show the low degrees of freedom, how even with this poorer evidence there are still many similarities. Because of the high amount of erosion this poorer quality may simply mean a formation has survived less intact over billions of years.

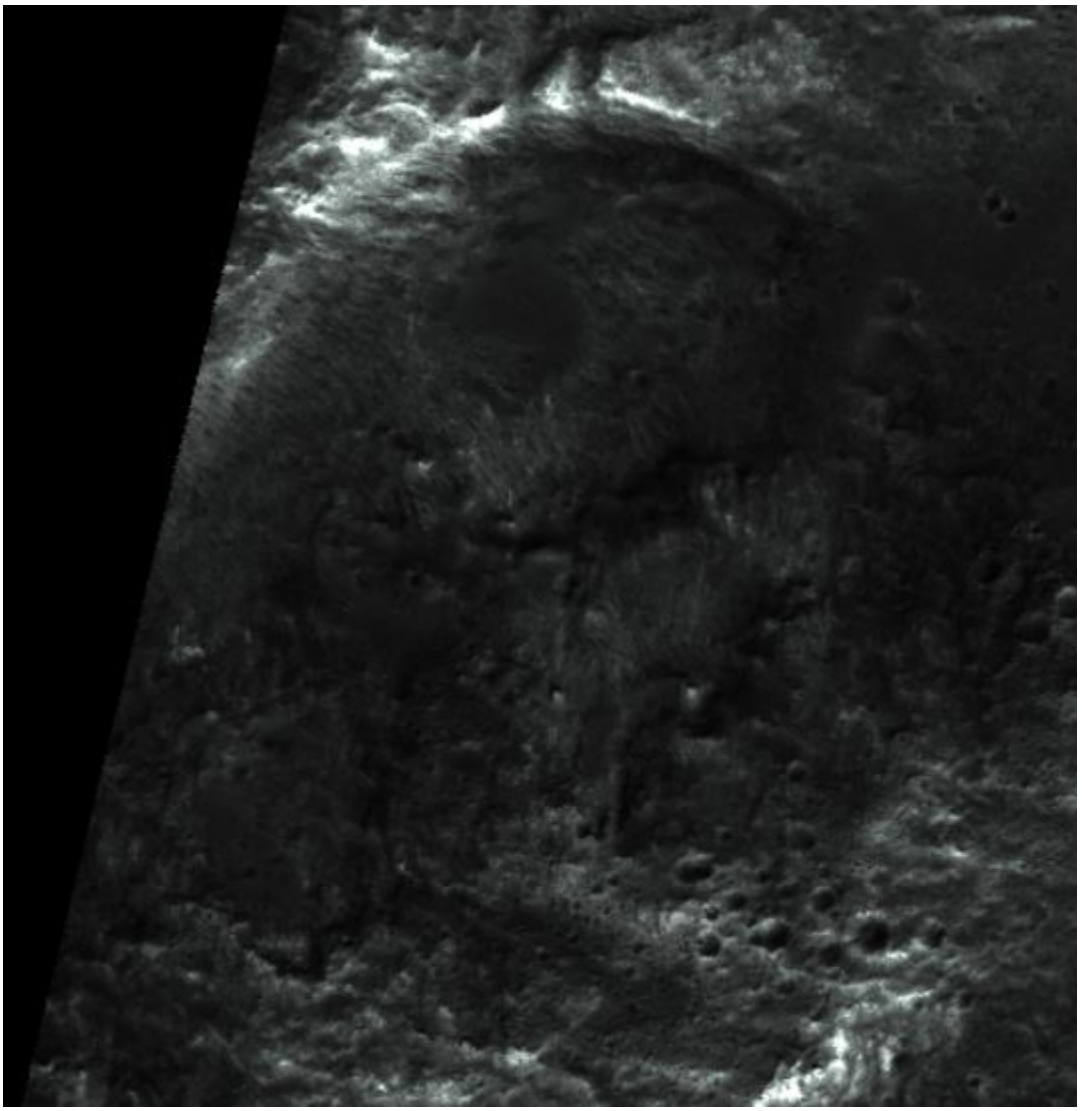

Figure 11. A more dubious face shape, perhaps pareidolia.

In [Fig. 12], A shows an unclear eye much longer than on the other faces. B shows an open mouth which has some resemblance to the Sculptor mouth. C shows a jawline and D a nose unlike that of the other faces. It may be a representation of the Sculptor which also appears in profile as does the Coin Face shown later in this paper. Pareidolia should be occurring somewhere, this may be an example of it but there is no way to tell without this being reimaged.

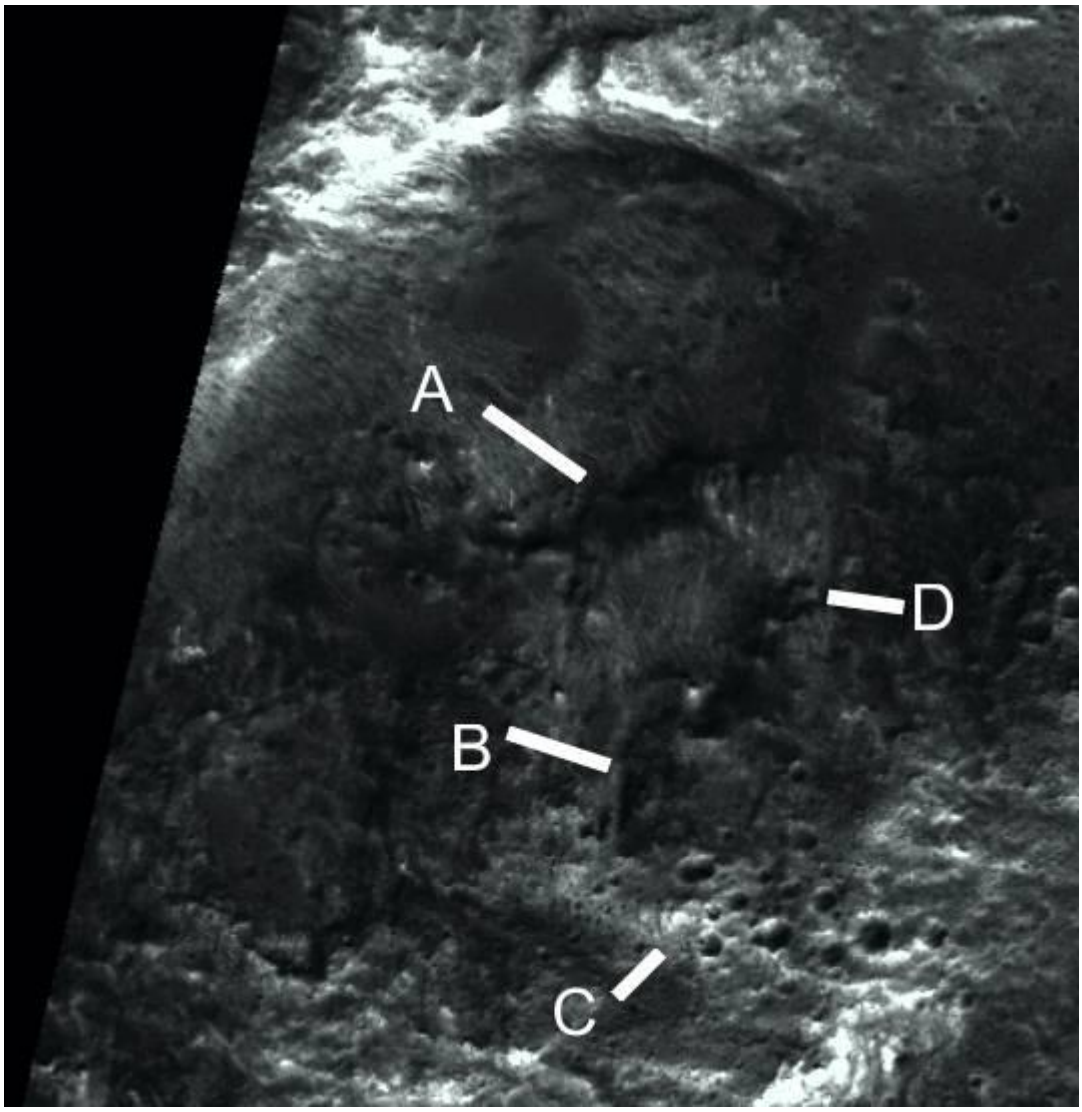

Figure 12. The face shape annotated.

Walls 1,2,3, 4 and 5

To make some form of classification, there are 5 main walls defined in the King's Valley. Wall 1 is where the main Crowned Face is found with the straight cliff to its left and right. The face in Figure 11 would then be above Wall 1. Wall 2 is opposite Wall 1 and contains the Sculptor and the fish shapes as will be shown. Wall 3 is at an angle to Wall 1 and has Figure 4 above it. Wall 4, as will be seen, connects at another angle to Wall 3 off to the left and has some other face shapes. Wall 5 has no clear face shapes but they may be eroded, many areas appear to have ambiguous shapes. These Wall classifications are arbitrary but can help to point out separate groups of formations. Later in this paper it will be shown how Walls 1 and 3 may repeat very similar shapes that seem arbitrary at first. It may then represent two murals of the same composite array of faces. This hypothesis of two murals is also a significant prediction that could easily be falsified. The face like formations on Wall 3 are unclear and so this is highly unlikely to occur by chance.

Wall 1

In [Fig. 13] Wall 1 extends to the left with the arrow, Wall 3 to the right with the right facing arrow. A shows the face in Figure 11 from the Mars Orbital Camera image, this could be regarded as wearing a kind of crown or hat shape. B shows the Crowned Face also called Face 2.

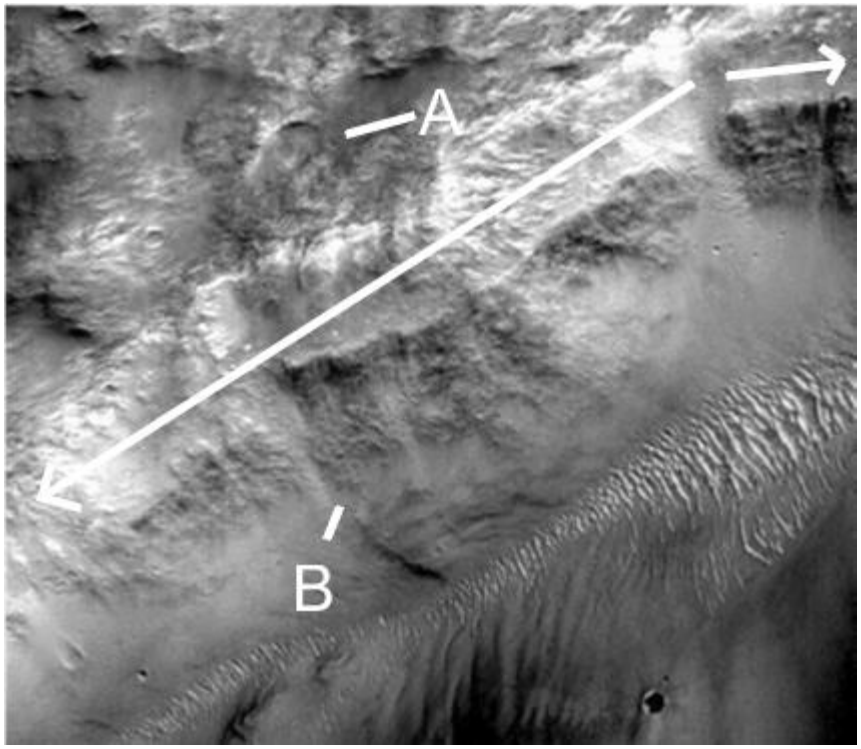

Figure 13. Walls 1 and 3.

A buried crown

In [Fig. 14] below there is a shape like another buried crowned face, this is referred to as face 4 in my book. It is found to the left of the Crowned Face and would be on Wall 1. This is part of a small section of Walls 1 and 3 not reimaged by HiRise yet, so formations in this area represent predictions that they will look more artificial in a HiRise image. There is also a section of Wall 2 opposite this that has not been reimaged. Since there are fish shapes on both sides a prediction is that more fish will be found there by HiRise.

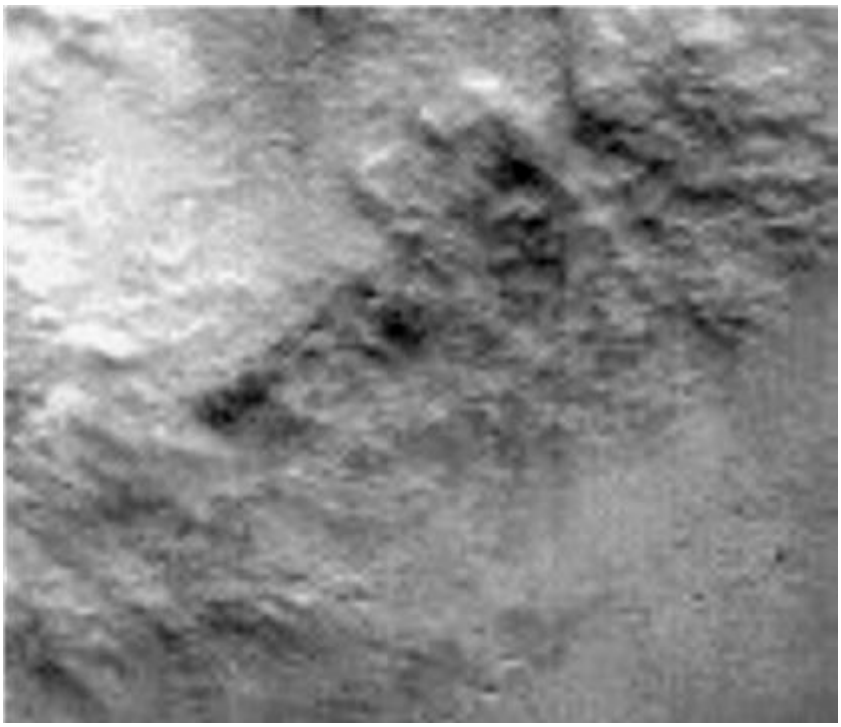

Figure 14. A buried crown shape.

In [Fig. 15], A shows the top of two apparent ridges that come from the top of the crown and point in at each other. B shows the edge of a crown line which continues on to the right. C shows a shape which may be part of the crown, like an animal or snake head. The ground below this is very smooth and it may be buried under sand. It is possible then, with no way to tell, that there may be a face connected to the crown buried here. This is then an a priori prediction that, when this area is reimaged by HiRise, more artificial shapes will be found.

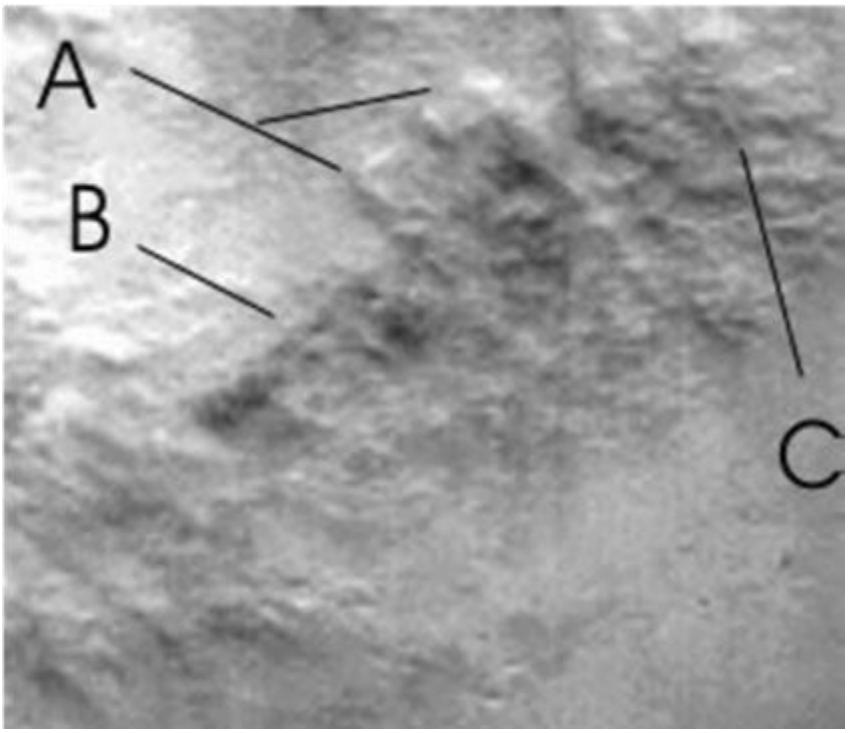

Figure 15. The buried crown annotated.

The boundary between Walls 3 and 4

In [Fig. 16] below Walls 1,3 and 4 are shown. Wall 1 is the small arrow pointing to the left, Wall 3 is the large arrow pointing to the left. Wall 4 is the arrow pointing to the right. Wall 3 is completely covered with possible face shapes; Wall 4 has many ambiguous eroded features that may have been faces. Two high quality faces are examined here. The color in HiRise images is a false color based on three different color filtered CCDs: red ("RED"), blue-green ("BG"), and near-infrared ("IR"). The wavelengths of these filters are: RED: 570-830 nanometers BG: <580 nanometers IR: >790 nanometers. These colors then are different from what we would see, because the HiRISE camera views Mars in a different part of the spectrum to human eyes. According to the HiRise team [17] false color imagery is extremely valuable because it illuminates the distinction between different materials and textures.

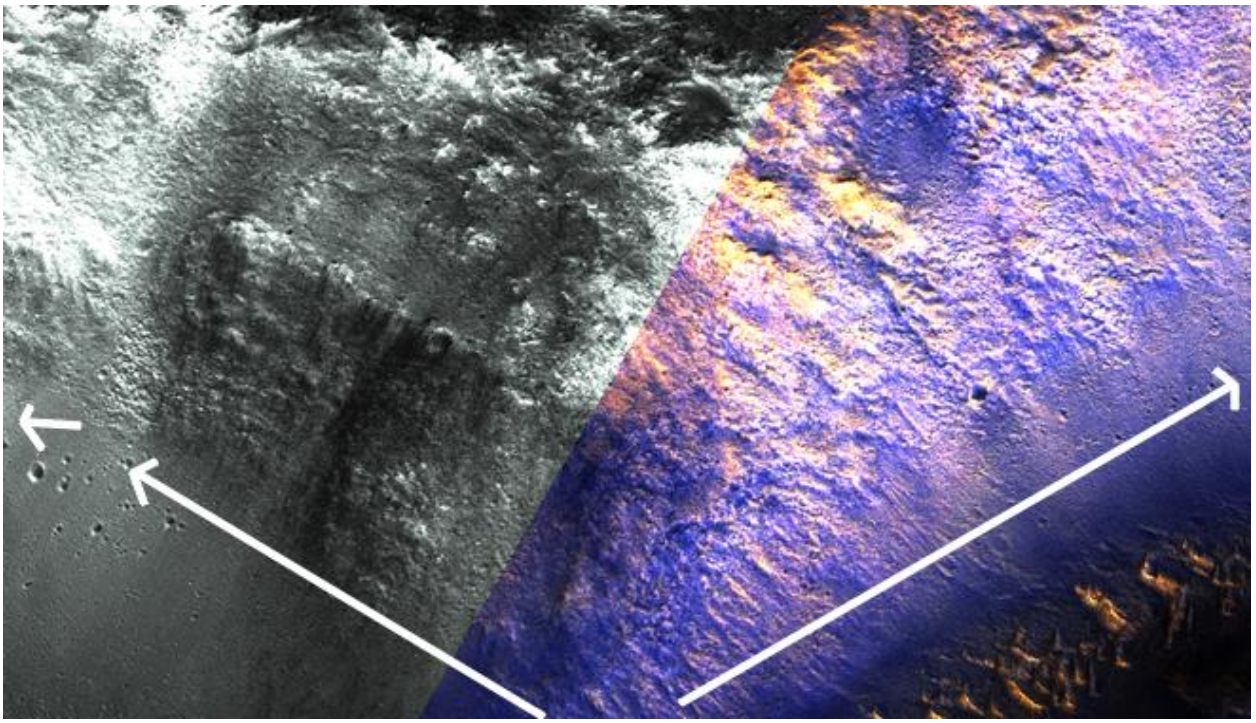

Figure 16. The dividing corner between Walls 3 and 4.

A repeat of Wall 1

[Fig. 17] shows a complex set of interlocking formations, this may be a repeated pattern of those on Wall 1. This is very unlikely to occur by chance; these formations could have been any other shape. Because many of these are not clear they represent a falsifiable prediction when they are reimaged. The more then this becomes similar to the Crowned Faces and Profile Crowned Face on Wall 1 the less likely this is by chance.

A shows Face 4, B shows the eye, C the nose, and E the mouth. This would be the same as Face 4 partially buried. F and H show a similar face like shape to face 1 on wall 1. The ravine in the middle of the face is similar to that of face 1, this also gives a nose shape here at H. F is a vague shape like an eye, G is the top of the crown. This would resolve a mystery in regard to why Face 1 is so eroded, it may be intended to look like this. Both seem to have a ravine or recessed area through them which is unlikely to occur by chance. I shows an edge like between faces 1 and 2 on wall 1. This continues down to the jaw line at N. K and O are eyes for this face. L and M show the nose and mouth. K then would be Face 2 or the main Crowned Face as a replica of it.

J shows the side of the next face which continues down to the jawline at Q. This is similar to face 3 on wall 1, the face that joins onto the main Crowned Face using its right eye. O and Z show its eyes; the right eye is lower than the left as on face 3. P shows the nose shape. This nose also bends to the left like on face 3. The three main Crowned Faces are usually seen together, these would then have been repeated as a motif with the three faces containing G, K, and O.
T shows a hollow below a nose shape, the same hollow appears as a mouth on wall 1. This may then be intentional and not a piece of the cliff that has fallen off. It may not be a face shape but some other kind of repeated motif. R and S show an unclear shape.

U shows the right jaw and face line of this second Profile Crowned Face, this would then correspond to face 6 on Wall 1. Just above U is a rounded shape that distorts this face, it may be a piece that has broken off. The upper side of this shows a layer that is missing below, this could be where the break occurred. V shows the nose which is less clear. W shows the eyes. X shows the crown shape which is similar to that of the first profile Crowned Face but has a wider area towards its bottom.

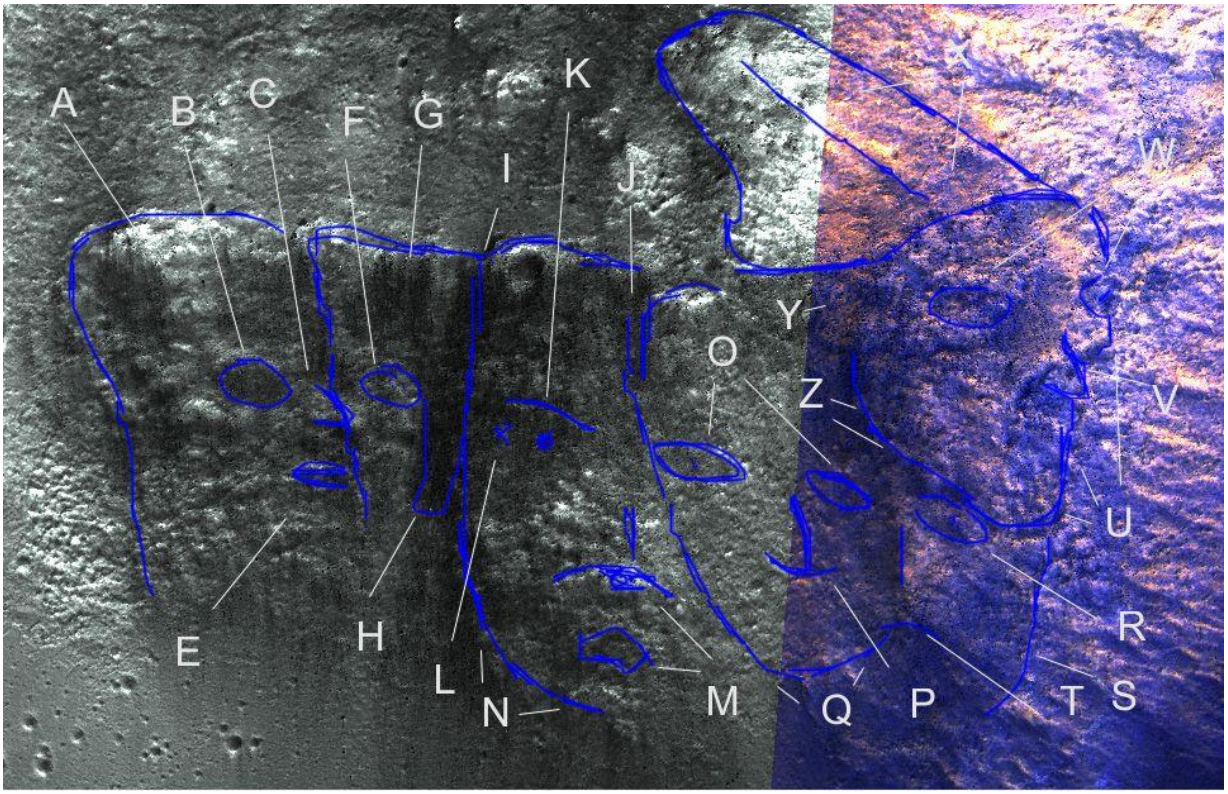

Figure 17. Wall 3 annotated.

The second Profile Crowned Face

[Fig. 18] below shows the second Profile Crowned Face; this is connected to the other faces to its left like those on Wall 1 to the first Profile Crowned Face. It is harder to see; the first Profile Crowned Face was also difficult to see at first because of its 3D effect of standing out from the cliff. It looks out to the right like the other profile face on Wall 1. This face also represents an a priori prediction, if this line of faces is being repeated as a motif then there should be a face in profile here. If this face then becomes much clearer when reimaged it would tend to falsify the null hypothesis, that these are random formations.

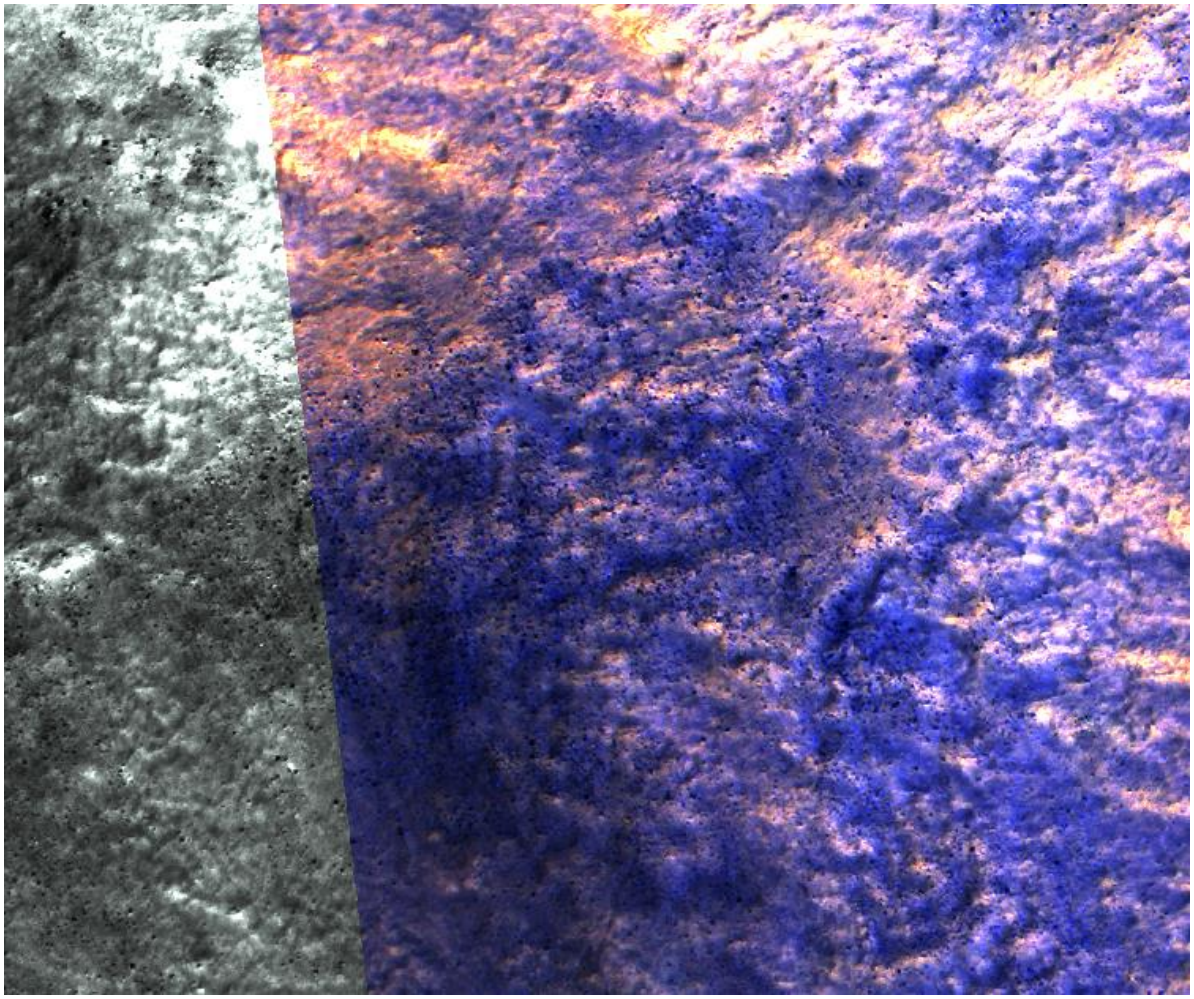

Figure 18. The second Profile Crowned Face.

Below [Fig. 19] is a separate outline of this face. The area above the mouth is at an angle, perhaps a piece broke off here. There is a nose shape just under this angled break. The hat is unusual and not the typical crown, it shows the unusual situation of so many similar crowned faces that one with a slightly different hat is remarkable. It shows again the exception proves the rule, there should not be this much repetition of crowned faces in one small valley by chance. The odds of this would be inconceivably large. It is also significant that this 3D face is on the corner between Walls 3 and 4, it may then look different according to where on the opposite cliff it is viewed. This then would be more like the Mount Rushmore faces that also change with the perspective.

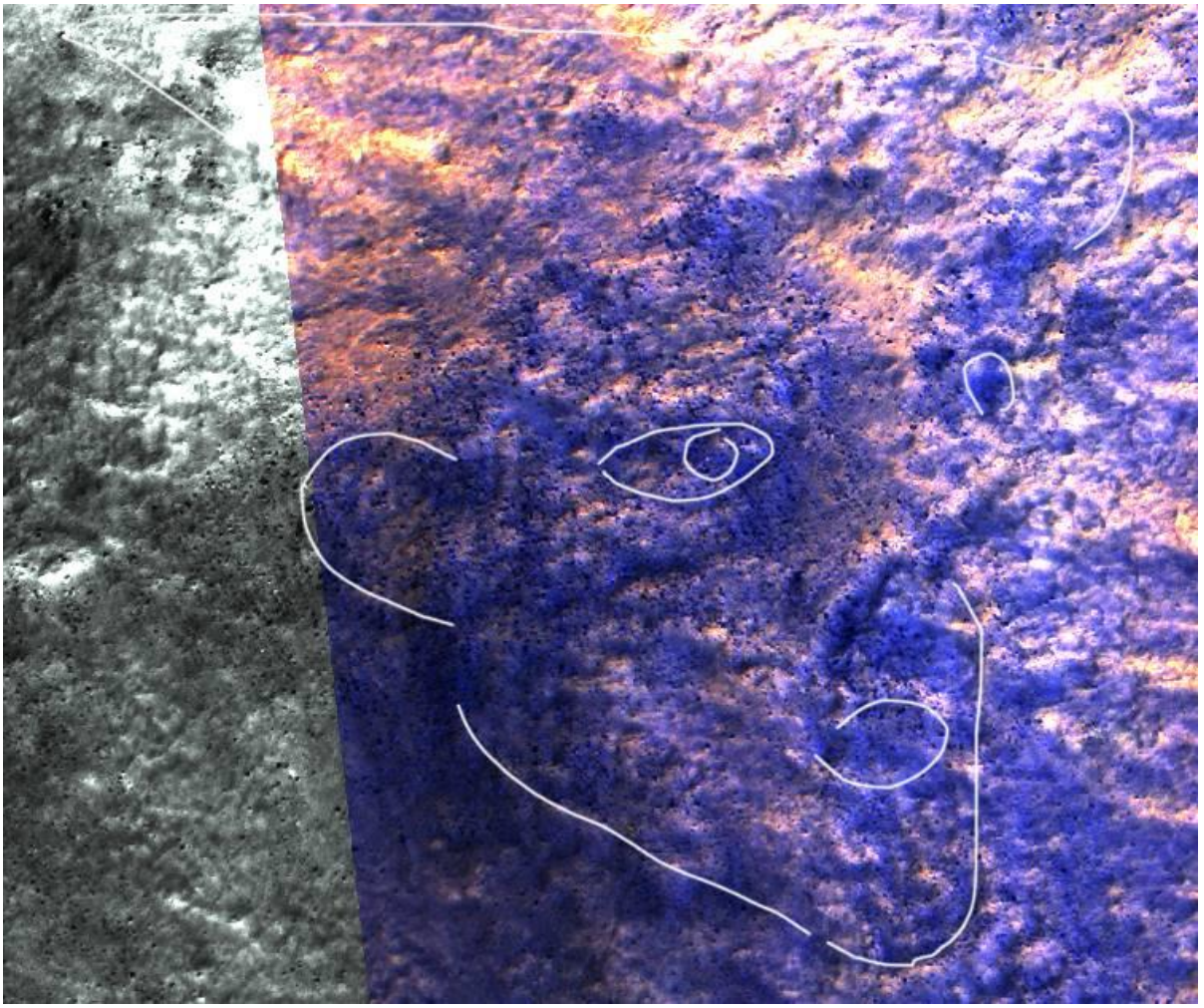

Figure 19. The face annotated.

So far there are virtually no parts of Walls 1 and 3 that do not contain some kind of crowned face. The chances of this happening by coincidence are truly astronomical. It is also unlikely to be pareidolia because there are no other places on Mars where similar faces have been consistently found. The Nefertiti face, the Meridiani Face, and the Cydonia Face are other face formations but no one has suggested other clear faces near them. Like a picture puzzle there are two other crowned figures [Fig. 20], the one on the right is on the edge of Wall 4.

The reclining Crowned Figure

This other profile Crowned Face can be called the reclining figure, the torso is shown above the line of faces [Fig. 20] and the head off to the left of them. There is a line connecting the back of the neck running right across wall 2, it seems have a symmetric pelvis shape. Also the ravine under it may have a hand going down, at the end there is a corrugation at the bottom like knuckles. This reclining figure only became clear using logarithmic stretching in the image, it darkened the face features enough to be visible. This face looks to the left and down on the left edge of this image. A face like this would be hard to form naturally, it does not follow the shadows of dunes. It appears to be carved into the rock, the elliptical shape of the top of the crown is very unnatural.

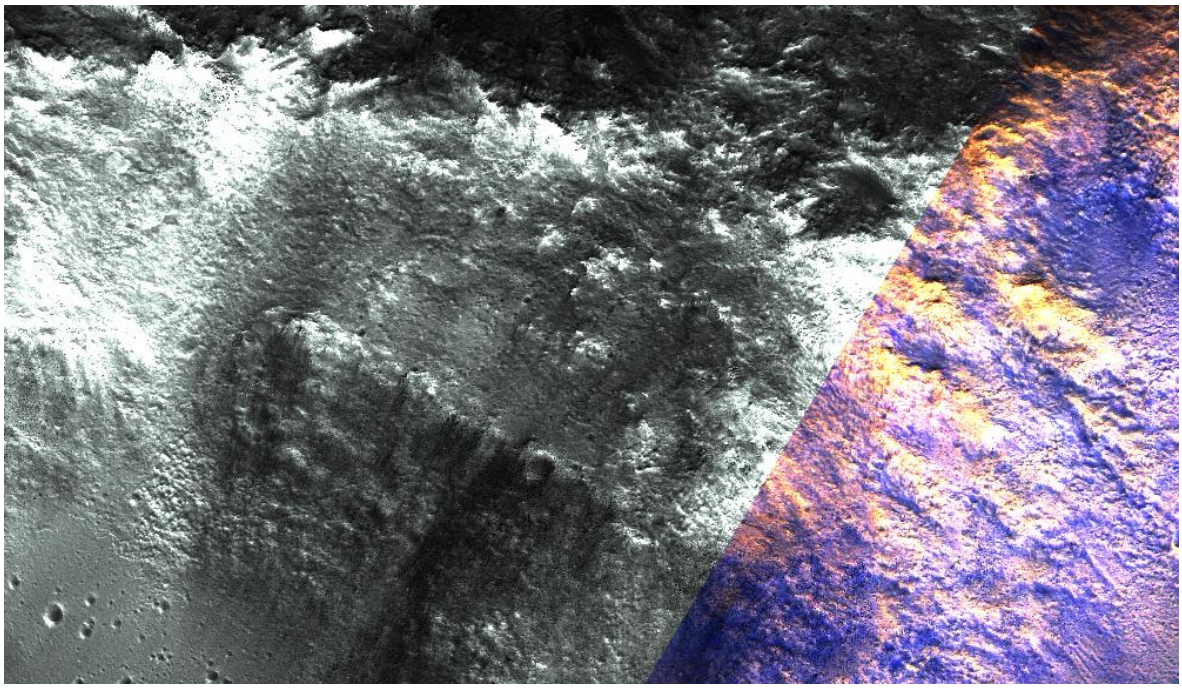

Figure 20. The reclining Crowned Figure is not obvious.

In [Fig. 21], A is a nearby face examined in [4]. B shows fingers and C the left arm. D is the line of faces [Fig. 12]. E is the mouth similar to the sculptor, F the nose, and G the eye. H is a 3D crown. I is the right shoulder and J the right arm with fingers. K is a line following the spine to a symmetrical rump shape at M. L is the left side. N are fingers on the right arm at O. P is the chest, Q the chin, R the nose, and S the eyes. T is an insignia on the 3D crown shape at U. The left reclining crowned figure appears to be crouching on its knees so the legs aren't visible. It seems to be giving an emotional message like humor.

The gap in the cliff seems to be used to have an arm go down to the floor of the valley, with an impression of the knuckles of a hand there. It can be demonstrating how it worked on the faces, like a tradesperson down on their knees concreting for example. It also gives the only clue so far as to how the torso was formed, this seems to show either a spinal cord or a line down their back. The pelvis shape may be meant to represent bone or perhaps markings on it, even clothes. Features like this will be critical for understanding more about these creatures. It then indicates how their joints worked, such as their shoulders and hips. It shows how far the head can tilt back. It shows how long their arms were, the Sculptor also showed this with one arm, and how straight their backs were. It also shows an attempt to convey a message with body positions like humor, this can give an estimate of their intelligence level and perhaps emotions. Because there are few signs of advanced technology their intelligence may have been low, they had few resources to build with, or they were in an early stage of evolution.

The Crowned Figure

The Crowned Figure on the right [Fig. 21] might be the same creature, it could start at standing up on the right and then the next representation shows it lying down and working on the left. The message of this is very striking, it could also appear to be showing a crowned figure as the boss overseeing the valley while the other crowned figure as a worker was building it. The result then is like a mural depicting cultural events and not just enigmatic faces. It implies as a prediction that the other faces also have different emotional features, and look in particular directions for a reason. We might ascribe for example a neutral smile to the main Crowned Face like the Mona Lisa, but the Crowned Face to its right as Face 3 appears angry. It is unlikely emotions would be so similar that we could read facial expressions like this, however on Earth we can see anger and some other emotions in the facial expressions of nearly any kind of animal. We can even detect fear or aggression in how fish move, given the fish carvings on Wall 2 there might be a common enough evolution to have similar emotional expressions. Panspermia may have connected the DNA on both planets, this can explain some of the similarities.

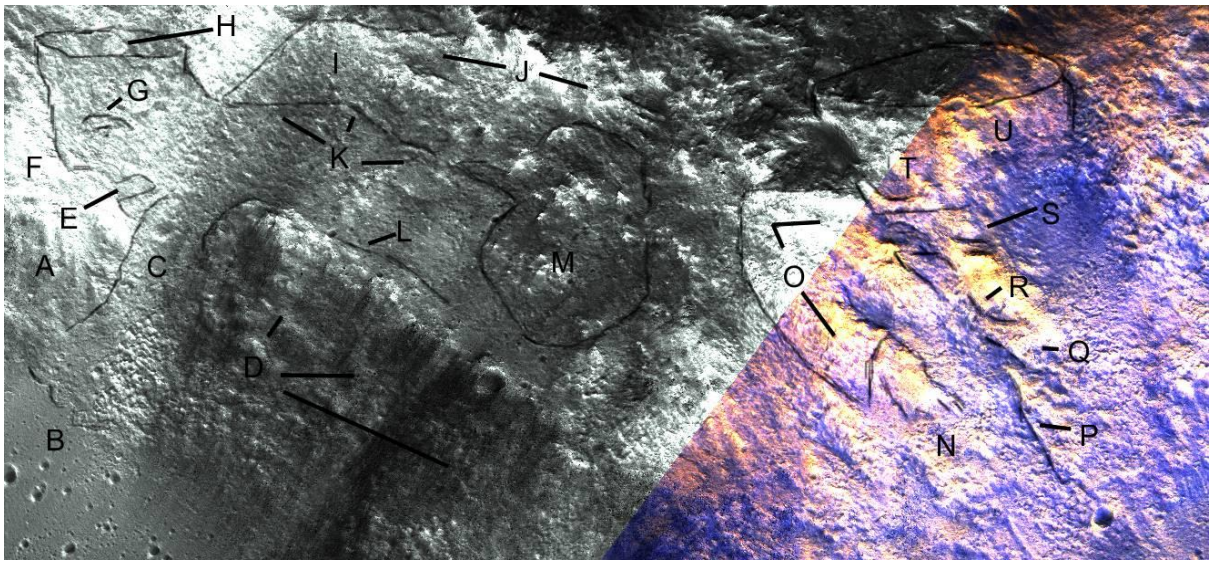

Figure 21. The two Crowned Figures annotated.

Walls 4 and 5

In [Fig. 22] Wall 4 and 5 are seen in total. The arrow to the left shows Wall 4 and the right arrow Wall 5. It is a prediction that reimaging will show more crowned faces on Wall 5.

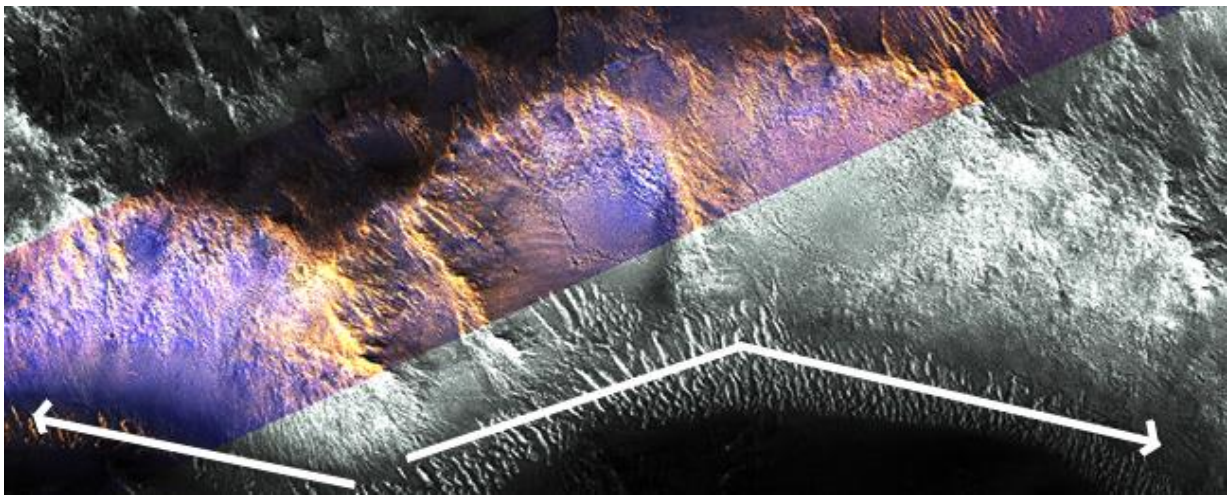

Figure 22. Walls 4 and 5.

The Shield Face

In [Fig. 23] there is another face shape with a flat top like a crown. This is to the right of the Crowned Figure, shown on the right [Fig. 21]. This is much more eroded and the rest of the cliff has other possible faces too unclear to point out. To give it a name this is called the Shield Face, as if a face was painted onto a shield a soldier might carry. There is no evidence of what this was except for a need to give it a name here. It may have represented an animal face because the nose is much thicker than on the other faces. If it is an animal face, then it may be another clue of the ecosystem there at the time.

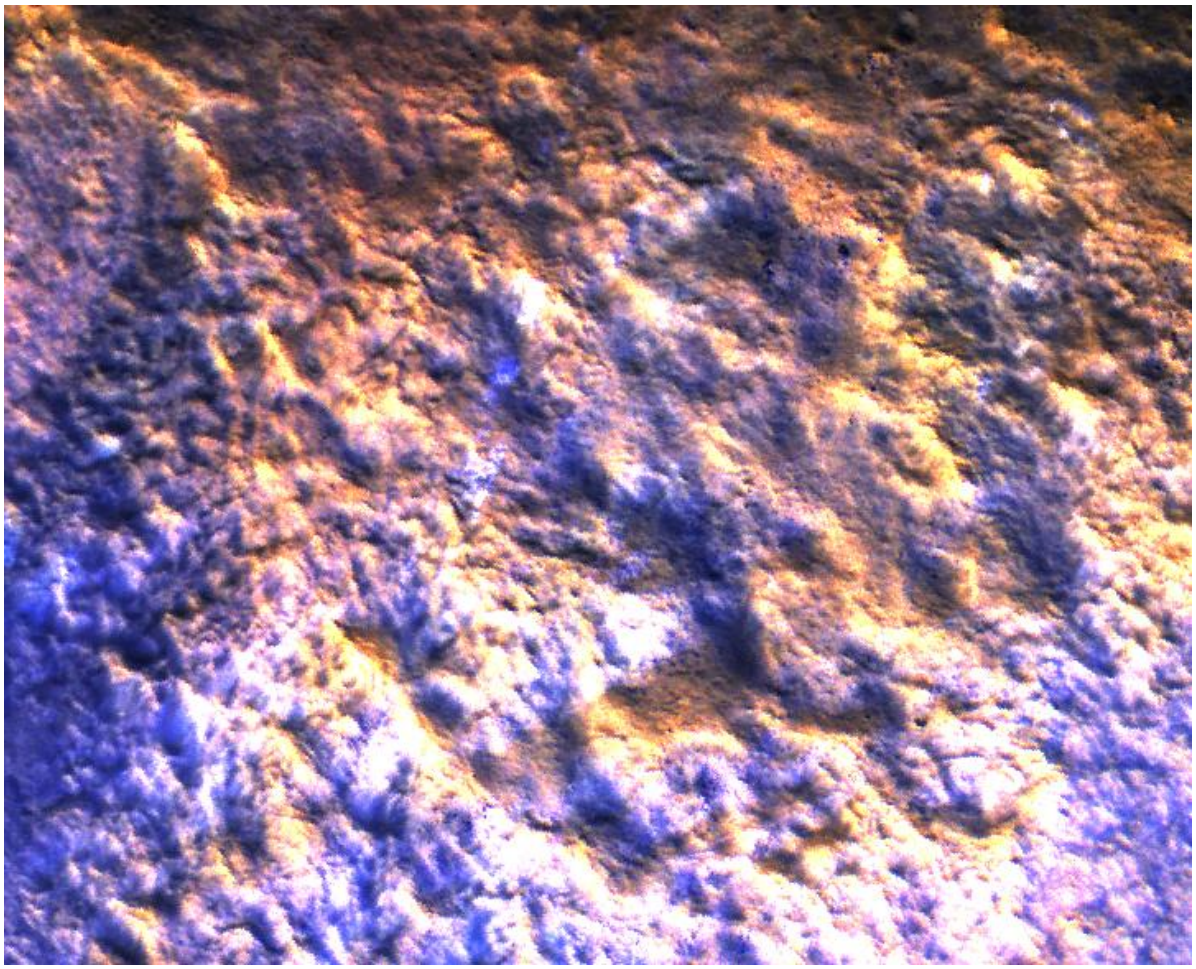

Figure 23. The Shield Face.

In [Fig. 24] the face is outlined. This is so eroded that much higher resolution would be needed to falsify this from natural terrain. The shape is very similar to the depression [Fig. 6]. The top has a similar straight band and the sides are also approximately straight. The area is highly eroded so some claim could be made that this is also random deep ravines and gullies. However, the boundary seems to be carved in a nearly continuous line. It would be easy to fault individual formations like this one, however the point here is their concentration in a small area and their similarities.

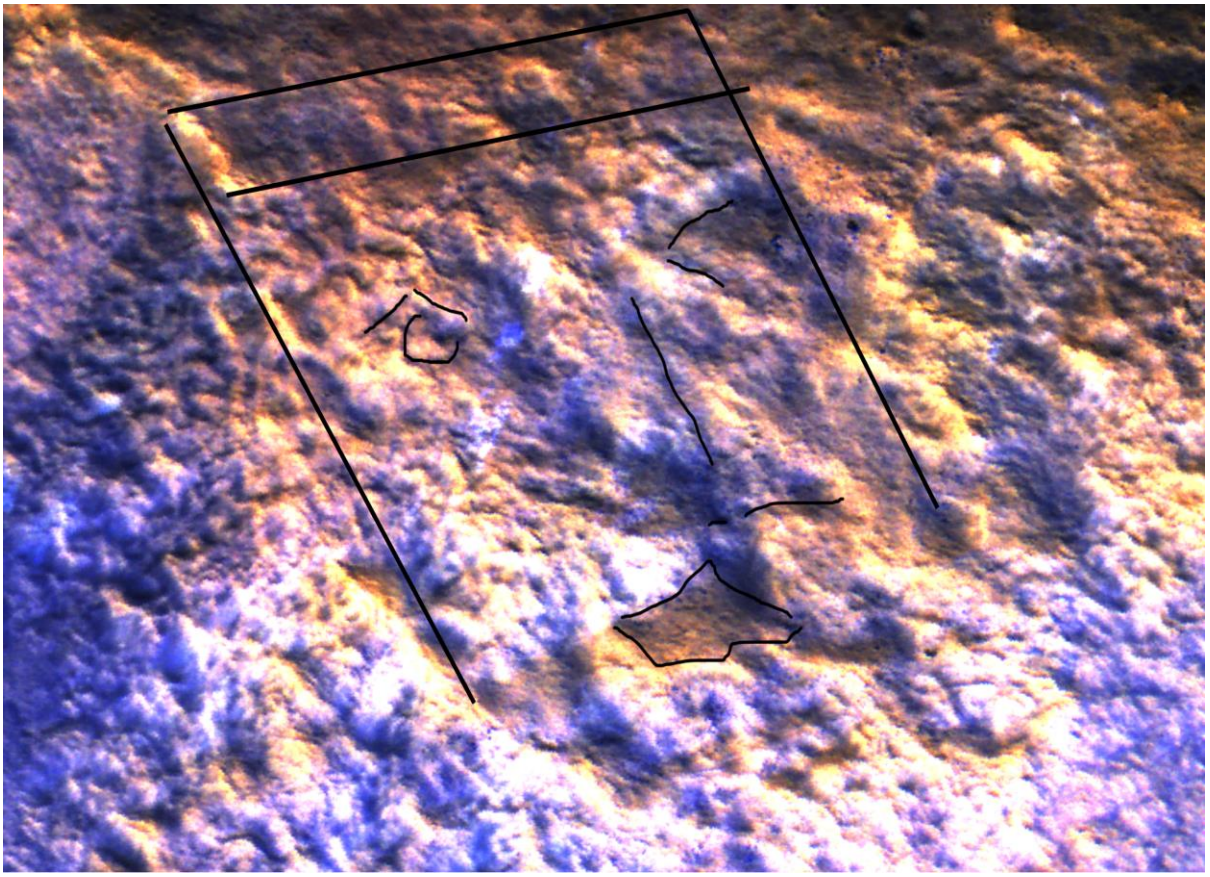

Figure 24. The Shield Face annotated.

The brooding face

In [Fig. 25] there may be yet another crowned face above the previously mentioned Crowned Figure, there are some dunes partially obscuring it. It is facing the same way as the Crowned Figure towards the main area of faces in the King's Valley. The large crater obscuring the right side of the Crowned Figure's face indicates it is very old. It is called the Brooding Face because it seems to have this kind of emotional expression, though this is probably a coincidence. With so many crowned faces it becomes difficult to have enough friendly names for them rather than just numbers. It may represent two different emotional states, happy in the lower face and angry in the upper face, like with the two main Crowned Faces. The two faces are also similar; they look down at the same angle with similar eye shapes except one has a different crown. The two noses are approximately the same and the mouths are about the same angle and size. There is a fold of skin to the right of the mouth like an edge of the cheek in both faces.

The program used to analyze these images is called ENVI, it enables an image to be stretched in different ways. This stretching affects the shading of various parts of the image, a logarithmic stretching makes an image much darker in some areas because of the nonlinear log curve. Square root shading takes the square root of the brightness for each pixel, this has the appearance of reducing the variations between lighter and darker areas. One good reason for using standardized settings is that manually adjusting them can bring out what the observer subconsciously wants to find. For example a face shape might have its brightness and contrast adjusted until it looks clearest, but this might also tweak a random shape into looking artificial. None of the images here have been adjusted except for these standardized settings.

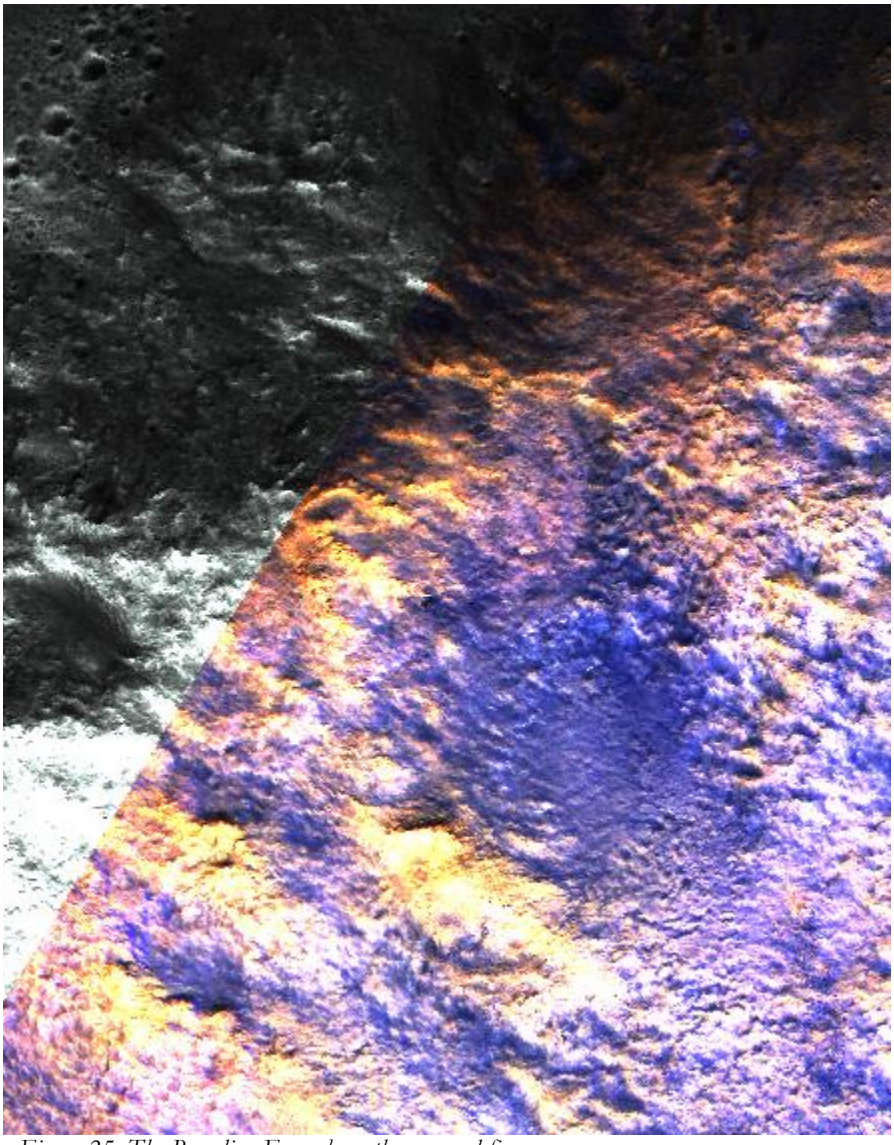

Figure 25. The Brooding Face above the crowned figure.

In [Fig. 26] the face is outlined.

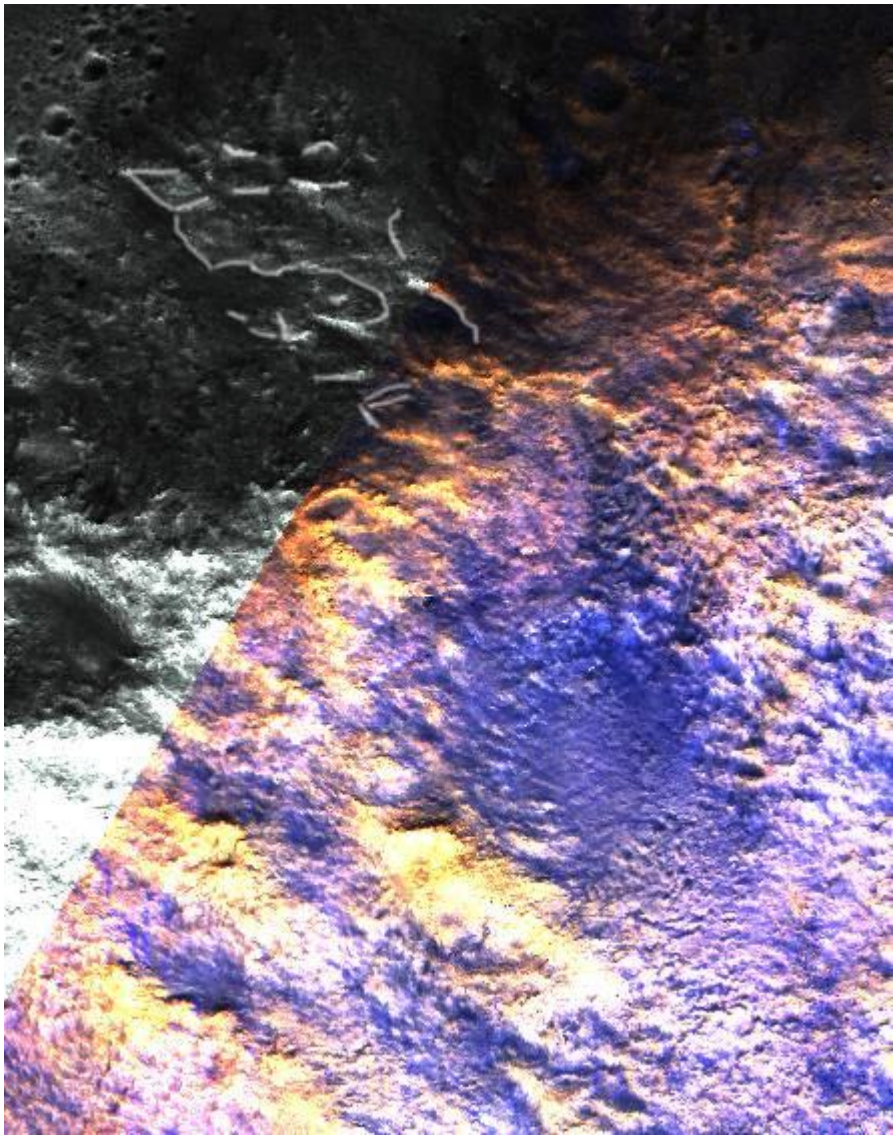

Figure 26. The Brooding Face outlined.

[Fig. 27] shows it using logarithmic shading, it stretches the light and dark shading more. There appear to be eye shapes in the right positions.

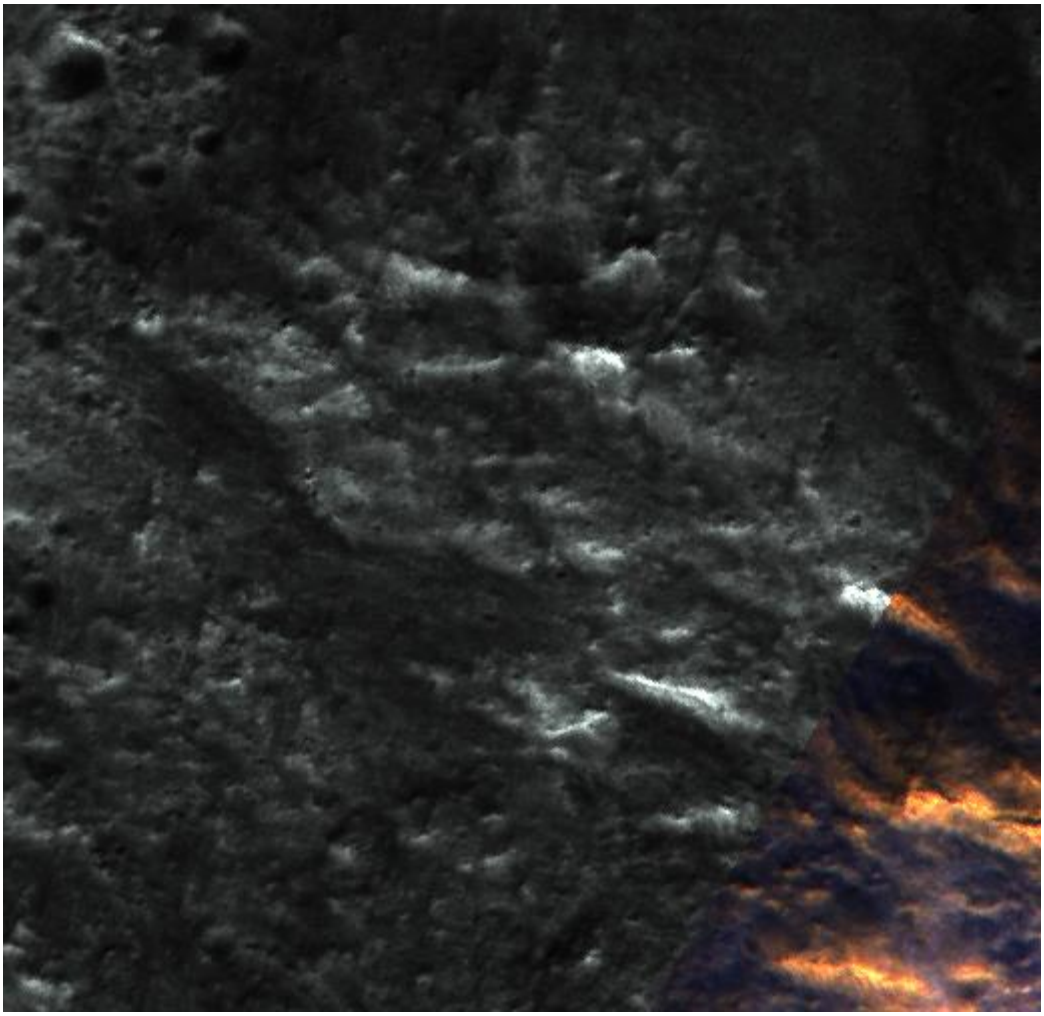

Figure 27. Logarithmic shading.

[Fig. 28] shows it using square root shading.

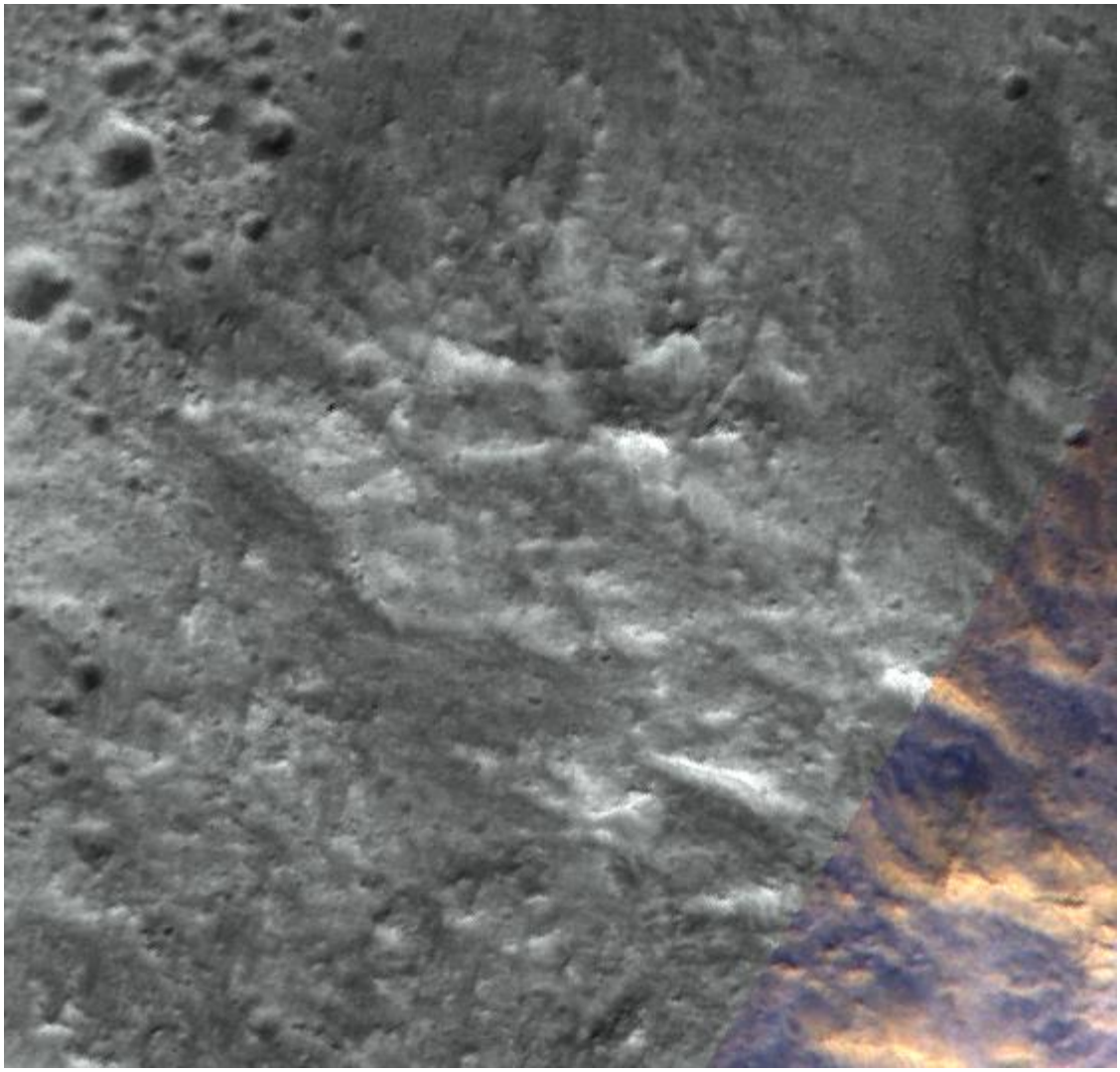

Figure 28. Square root shading.

A triangle

In ESP_034864_1830 another part of the King's Valley is imaged, there is a triangle shape in that image [Fig. 29]. It appears to be standing out from the cliff as if built to be seen like a sign, or it could have been buried with less erodible rock and been exposed over time. It is close to the possible dumping ground area shown later [Fig. 53]. There is a possible face on this but very unclear. When reimaged if a clear face is there, then it will match the next triangle shown.

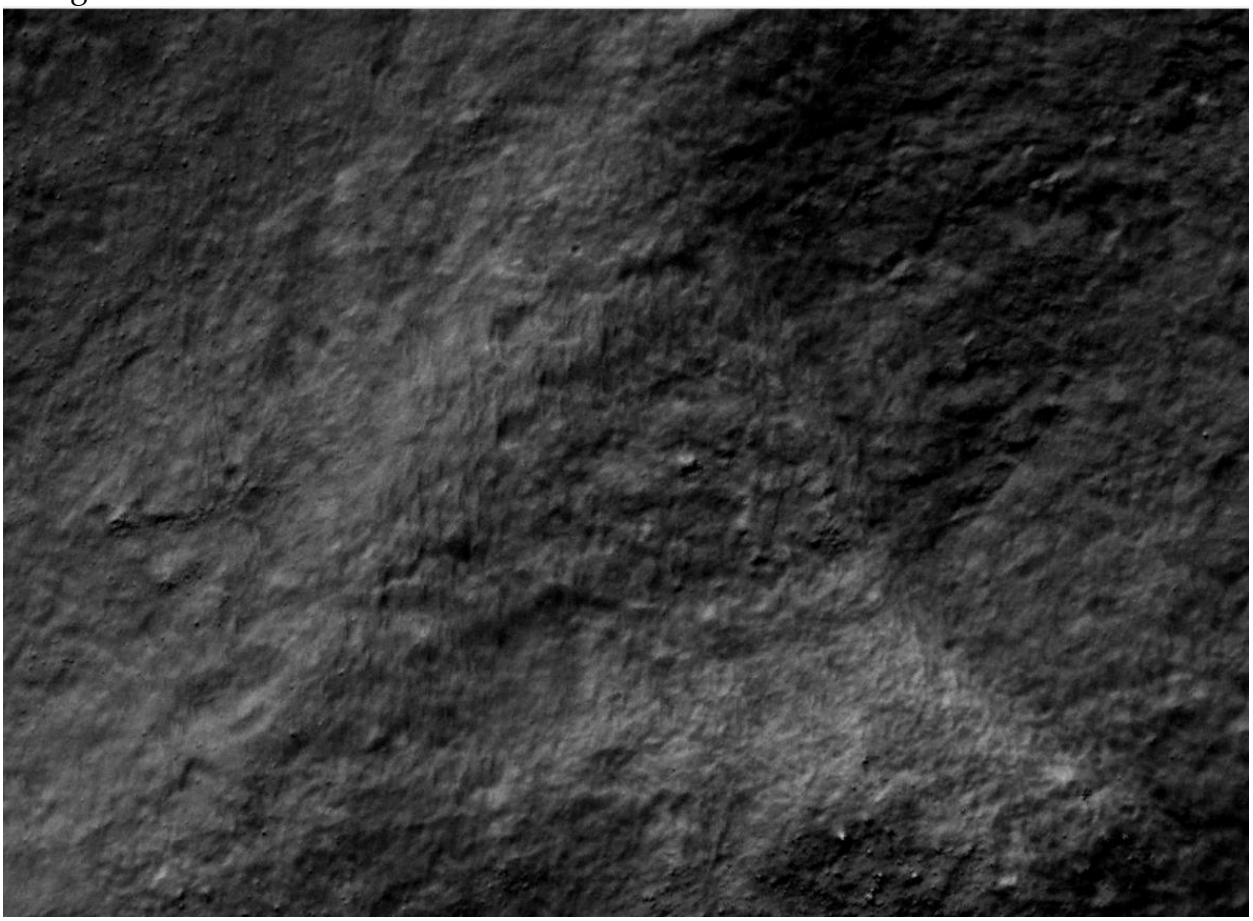

Figure 29. A triangle shape.

The Coin Face

There is another triangle on the edge of ESP_18223_1830, similar to the triangle above. This is shown in [Fig. 30]. It appears to have a face looking to the right with a smaller triangle shape below it. Because of this coin like profile it is referred to as the Coin Face, on Earth some triangular coins have been used.

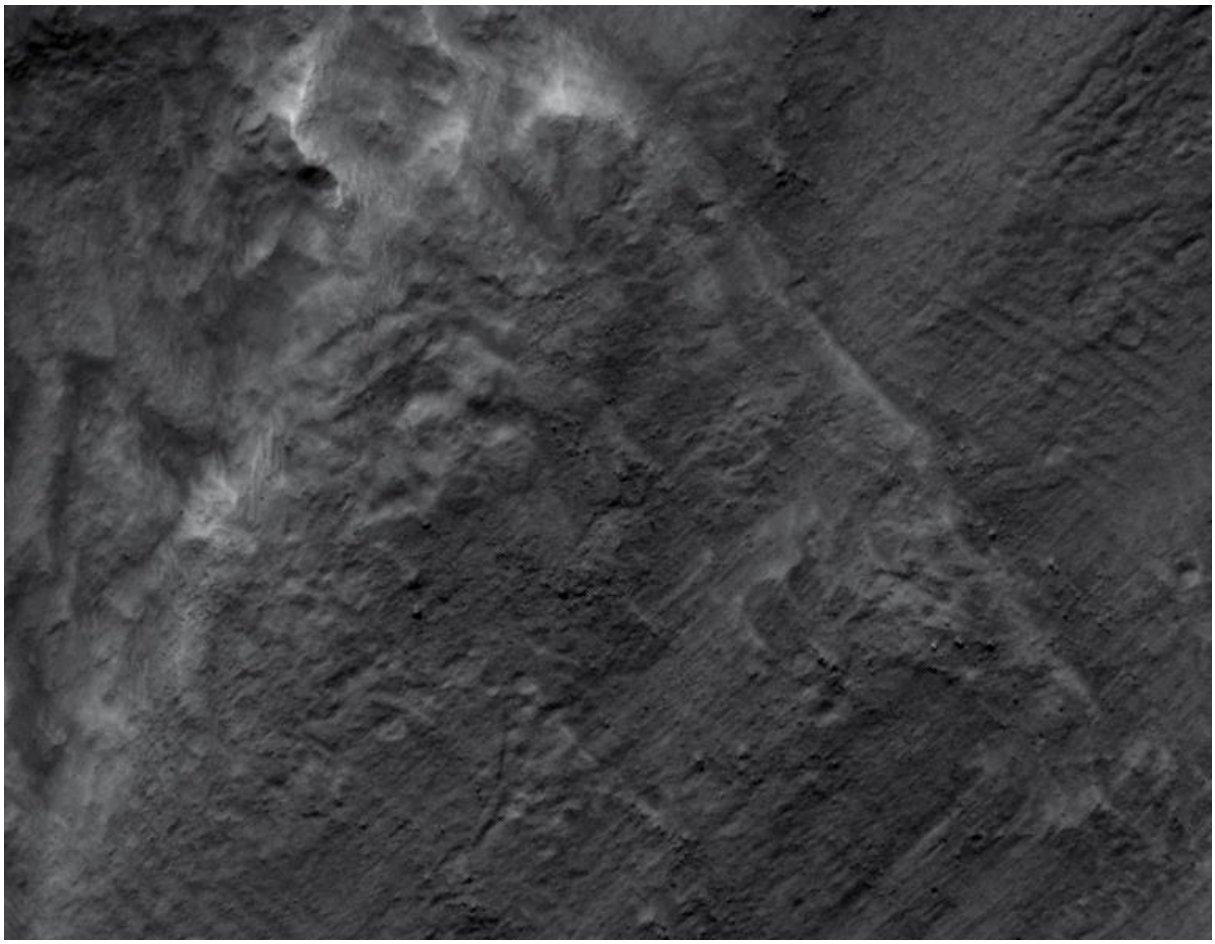

Figure 30. The Coin Face.

In [Fig. 31] the triangle with the possible face is outlined below, there may also be another face next to it looking to the right. It may be a kind of plaque with a face on it, perhaps the same creature as the Sculptor. There is an impression of hair or some kind of cape, there is a squarish shape in the rock behind its head, this may have been a crown like on the other faces. The Sculptor also appears to have hair on its head but no crown. It may have a concave base like the triangle in [Fig. 29] and the smaller triangle under it also has a concave base. This then gives three triangles with similar shapes in their base like a common motif.

The grooves in the hair may be difficult to explain geologically. The ones at the top are near vertical and might occur from water running down the rock. However, on the back of the head they are more horizontal, so water cannot run that way. They should then have the same process that formed them. Other cracks like these are not clear elsewhere on the cliff or on the other triangles. The face is also roughly the same size as the sculptor face in the King's Valley. The two triangles may represent boundaries or signs to denote the main face area is ending there. Beyond these triangles would be the dumping ground of rubble referred to in the paper on construction materials.

Figure 31. The Coin Face and small triangle outlined.

Fish sculptures

In [Fig. 32]] below the fish shape looking to the left was shown in [4], there may be another looking to the right about the same size and shape. Most people easily see the fish on the right. It is like an Earth pelagic fish similar to a parrotfish or many other kinds living on coral reefs. It might then indicate a common feeding pattern to those on Earth, having eaten kelp or other food on coral or stromatolite formations.

Bianciardi et al. [18] suggest the Opportunity Rover may have found stromatolites in Meridiani Planum not far from Libya Montes. More recently a controversy occurred with the Curiosity Rover where fossilized microbial mats may have been passed without examination. On Earth there are found carpet-like colonies of microbes in shallow bodies of water such as lakes and coastal areas, this would be similar to the paleosea near the King's Valley and the paleolake to its east [Fig. 2]. These are known as microbially-induced sedimentary structures (or MISS), they are found in shallow water all over the world throughout Earth's history including at the same time this paleosea existed next to the King's Valley. Bianciardi et al. [18] discuss these formations in Gale Crater which is close to the King's Valley. If true then these may give more clues to that ancient ecosystem of food for this fish, panspermia may have connected Earth and Mars with simple microbes like this.

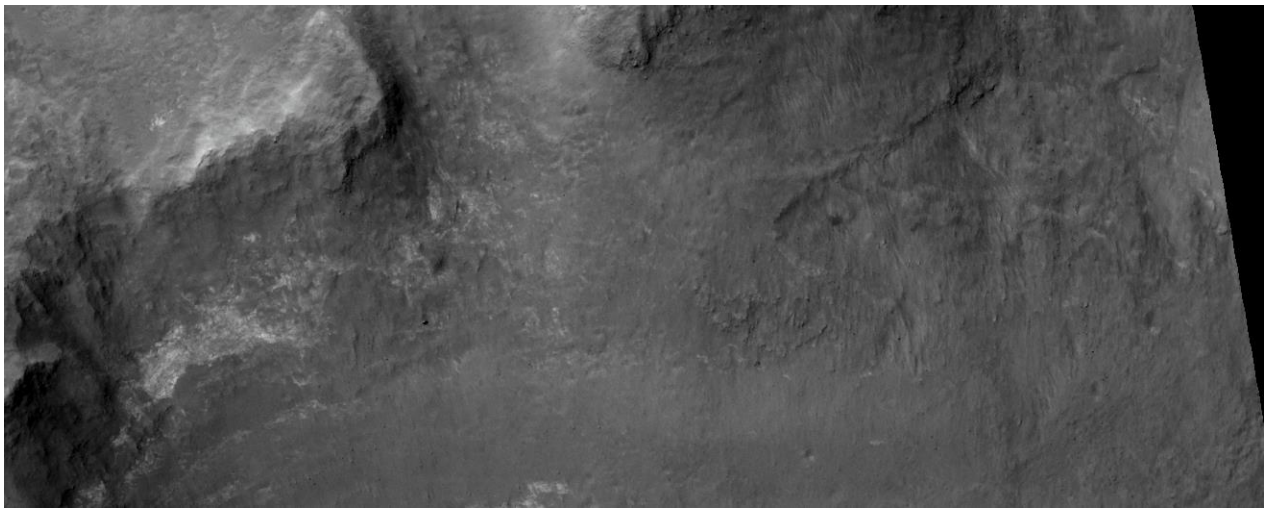

Figure 32. Two fish.

This second fish is shown outlined [Fig. 33]. The tail section is clearly cut into the cliff; the pale material could denote a different kind of fish or the fish on the right had this coloring but it was eroded away. If artificial these details are important information, they give clues as to the aquatic ecosystem that would have existed at the time. It implies there was a paleosea and that these sentient creatures ate fish, they perhaps were aquatic or amphibious themselves. This would explain why few signs of construction have been found, most might be under the dried mud when the oceans sublimated and froze at the poles.

Visitors to the King's Valley might then have spent a lot of time on the water, fish as food might have been significant culturally to them here. There is no indication of scales on any of these fish, however there may be a slit for gills or the edge of a fin. Some of this correspondence with Earth species could also have come from panspermia, material exchanged between Earth and Mars on meteors with some organic material on them. While it is unlikely fish eggs could make this journey other kinds of life such as algae might have. This might then be tailored to evolve a kind of fish suited to it, and so a similar fish could evolve from this panspermia.

Figure 33. The left fish outlined.

Two more fish

Further up the valley wall towards the possible dumping ground there may be another two fish. One [Fig. 34] appears to be a different species, the fin is much higher like a goldfish, an angelfish, or many other kinds of fish living around coral reefs. The eye shape is clear and in the right position. There is nothing here out of proportion compared to an Earth fish. This is an important point because a formation could look like a fish in a cartoonish or exaggerated way, this looks more like a tracing from a photograph. Not only is it strong evidence for artificiality but is almost an anatomical diagram for what this species could have looked like. At some point then when the reality of what things like this are is established, the more interesting discussion will be of what they are showing.

Figure 34. Another fish with a dimersal fish shape.

The outline is shown below [Fig. 35]. It appears to be carved into the cliff with a different albedo to the rocks around it.

Figure 35. The fish outlined.

In [Fig. 36] there seems to be a demersal fish, similar to a flatfish like a bottom feeder seen from above. Like the other fish shape this seems to be carved into the rock. Another fish of this shape may appear in [Fig. 33], in [4] it was proposed the fish on the right had a second one of this same shape on top of it. There could then be a representation of a pile of fish as if caught. The tracing of this second fish is very similar to in [Fig. 36] which represents a successful implicit prediction. It is a prediction then that when a possible artificial shape is found others of similar shapes should also be found in the same area. These prevents a statistical fallacy of whatever is found seeming to be significant. The implicit predictions in the King's Valley then are the same kinds of fish and crowned faces will be found over and over.

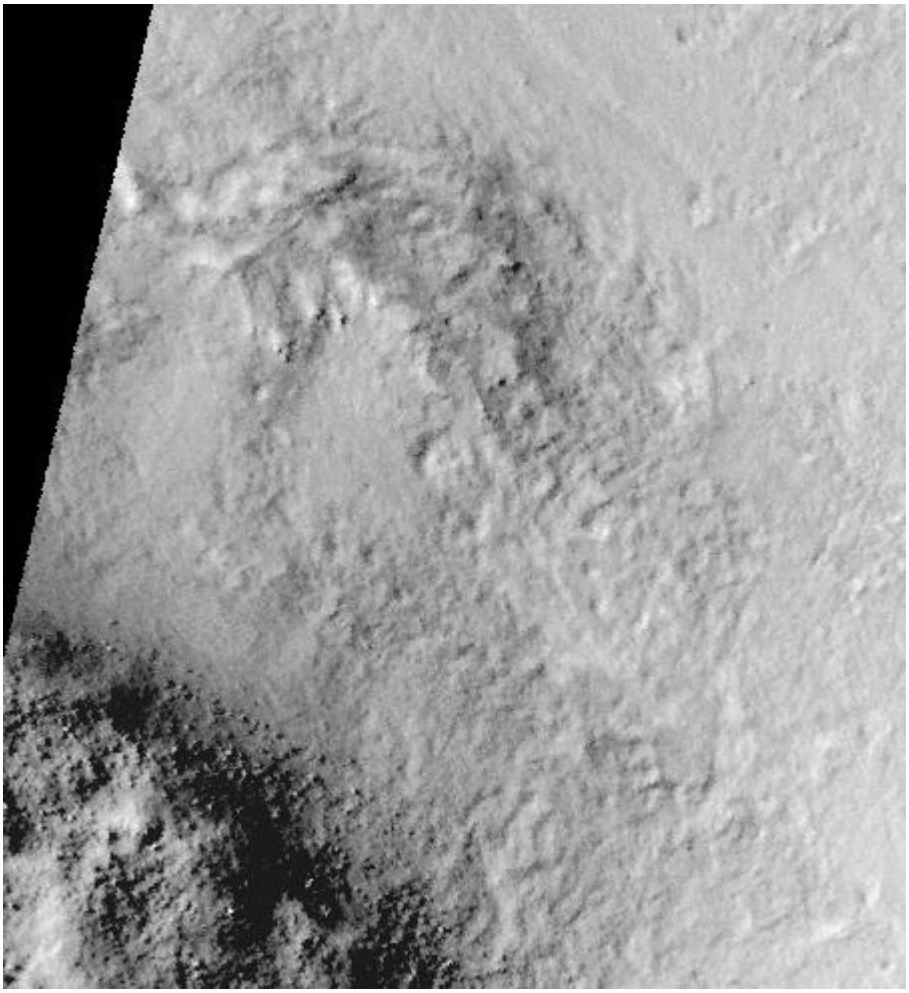

Figure 36. A flatfish or dimersal fish.

This is shown outlined in [Fig. 37] below.

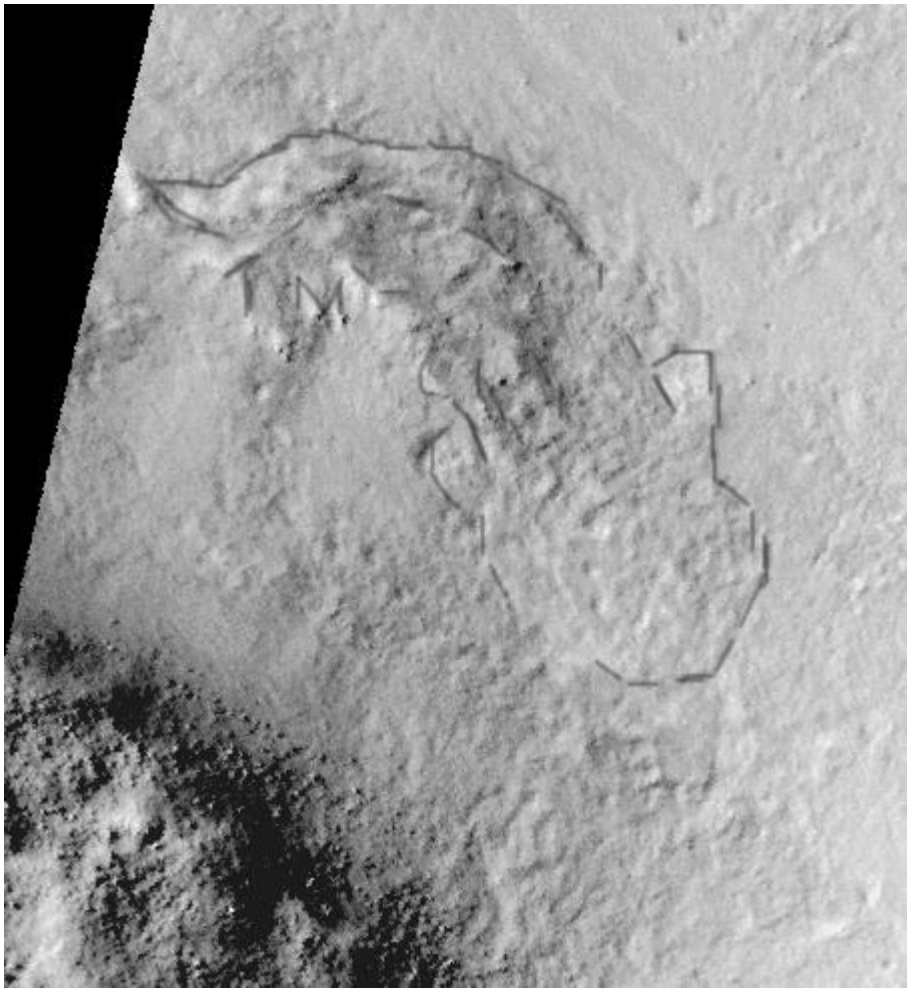

Figure 37. The fish outlined.

A higher face

This face [Fig. 38] is found opposite the previous two fish shapes. It is higher up and should be visible from the valley floor.

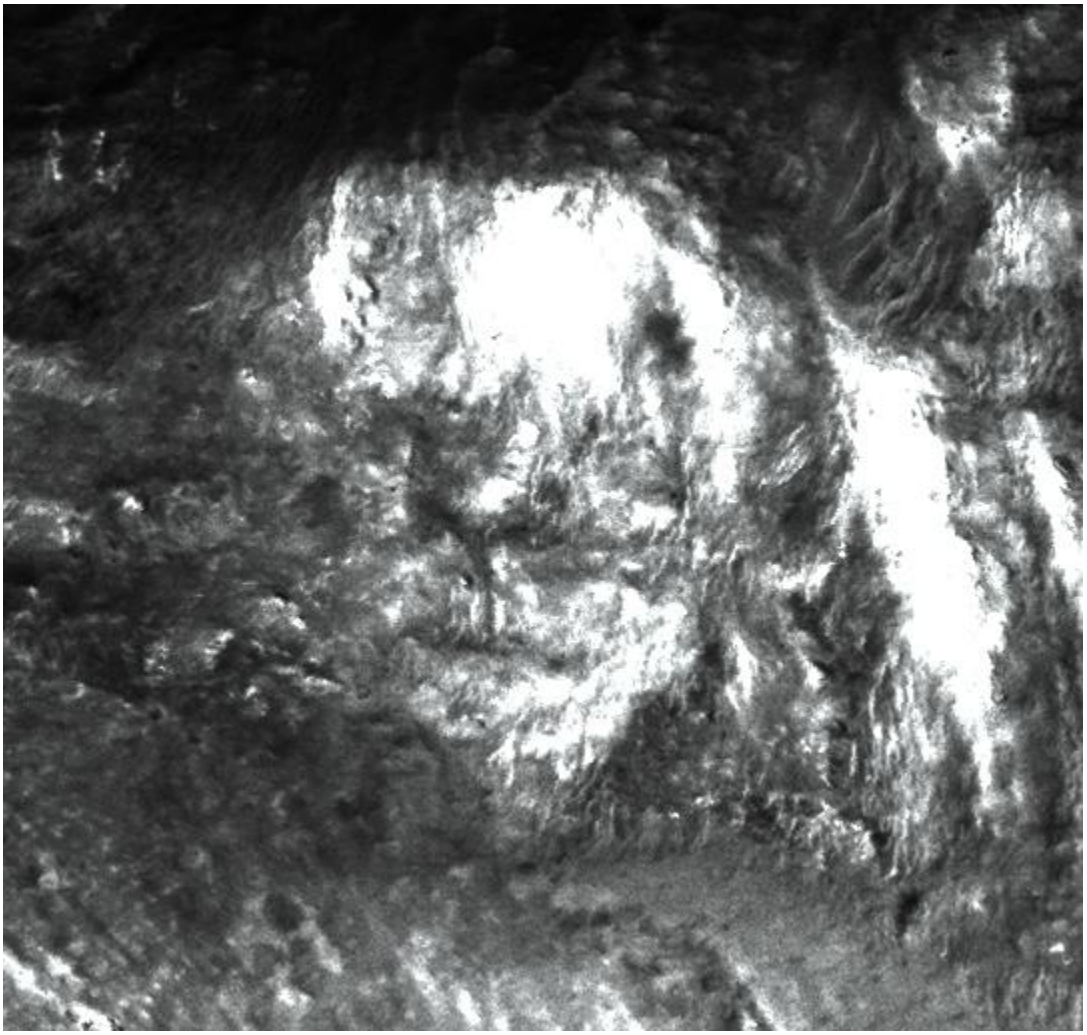

Figure 38. The High Face

In [Fig. 39] A and B show the eyes, C the mouth D the nose, and E the crown.

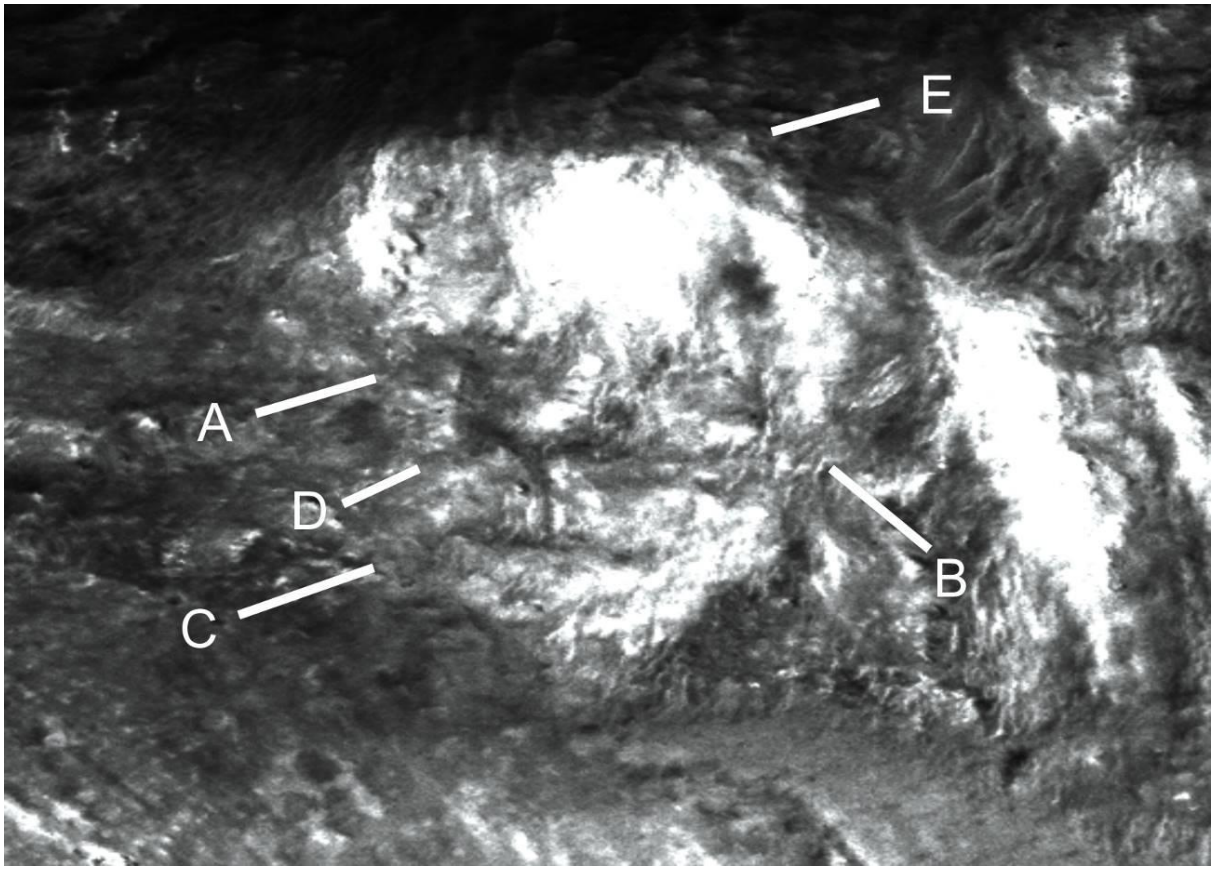

Figure 39. The High Face annotated.

[Fig. 40] reduces the contrast much more to show details in the crown. The two pale shapes on the sides of the crown are symmetrical, there is a central pale line in the middle of the crown. On the left the edge of the crown is much more pronounced.

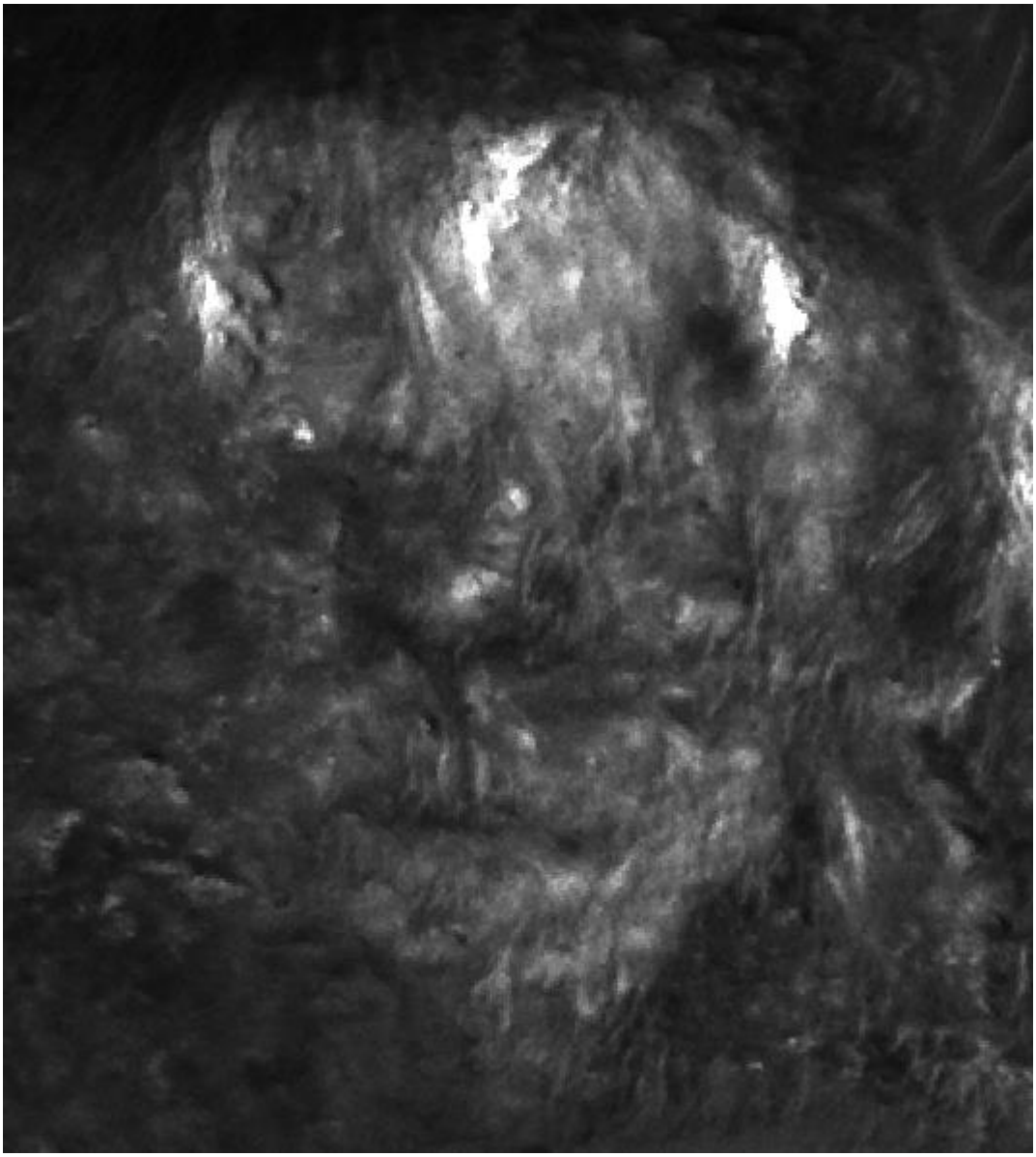

Figure 40. Low contrast image of the High Face.

[Fig. 41] shows the context of this High Face, shown in the red rectangle at the top. At the bottom of the image is the King's Valley floor, standing in this position looking at this High Face the two fish shapes [Figs. 34 and 36] would be behind you. This should be visible from the valley floor; the cliff may be excavated under the face to make it easier to see. It is a similar motif to Mount Rushmore seen from below.

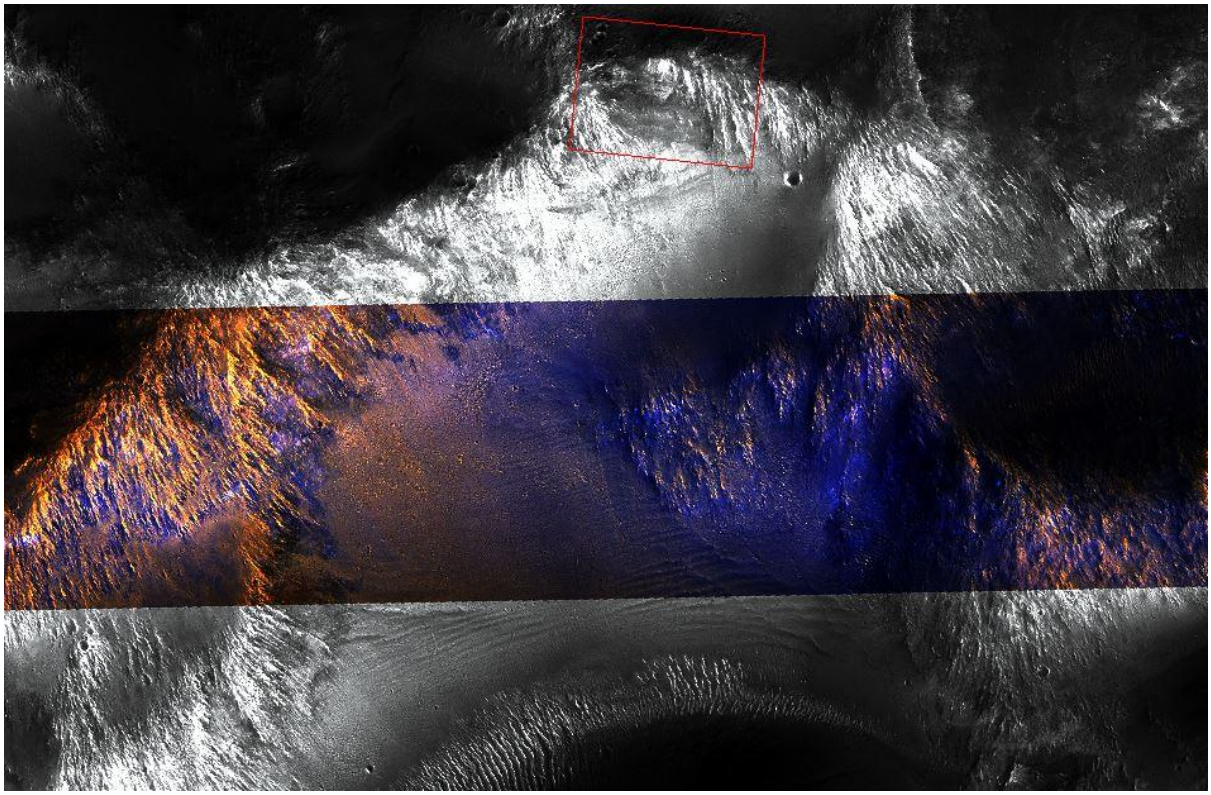

Figure 41. Context image of the High Face.

Overlays of Faces 2 and 3

In [4] the Crowned Face, also referred to as Face 2 here, was overlaid on Face 1 and Face 3. These three are the main Crowned Faces. It was a prediction that with the HiRise images this overlay would be much clearer and with more matches between the faces. Face 1 on the left of the main Crowned Face has not been reimaged yet, below [Fig. 42] is an overlay from the HiRise image of Faces 2 and 3. This shows Face 3, the Angry Face, with a 30% transparency meaning that from 0% being invisible and 100% being opaque this is at 30%. The correspondence between the two is quite close. It is an indication then of this low entropy, faces in clouds tend to look very different from each other. Not only are the faces in the King's Valley similar to each other but three of them overlay very precisely on each other. This should be impossible to occur by chance. The two faces are so similar that this overlay might appear to not be working, it would be like if the reader made an overlay of their own face with two slightly different facial expressions. As the overlay changed from one to another, like the appearance of a smile to a frown here, the difference would be hard to see. It is not then a problem with the overlay but how similar these two faces are.

Figure 42. 30% transparency

[Fig. 43] shows the overlay with a 40% transparency. In [4] different points of correspondence between the 2 faces are analyzed, then gave each a 1 in 10 chance of occurring by chance. 30 or more could be found here giving 10^{30} to 1 against this being a coincidence. This figure may well be high, but the chance of 2 people on Earth looking so similar might well be in the hundreds of millions to 1. A p value with such a result would be considered highly significant, even proof, in statistics.

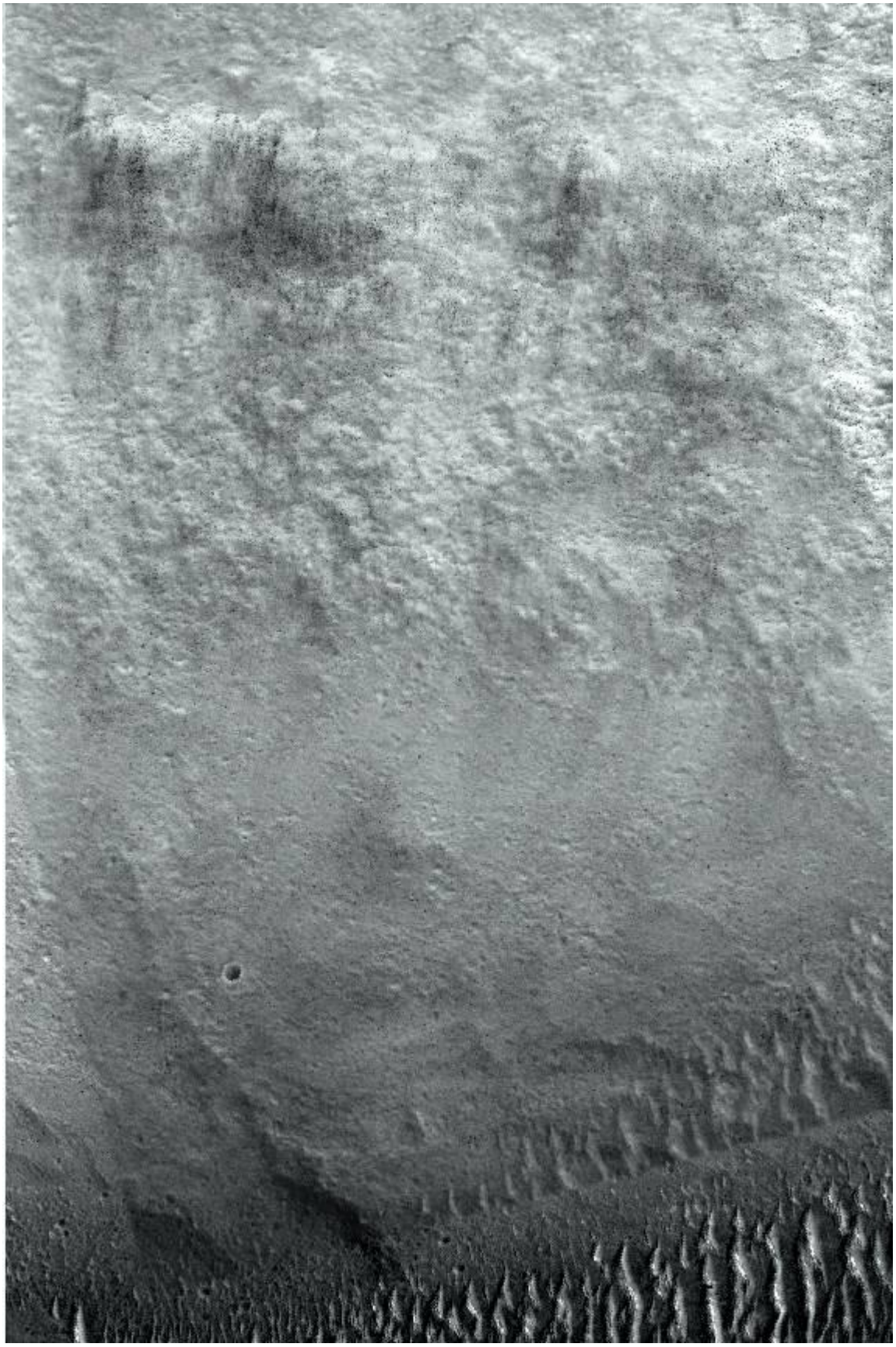

Figure 43. 40% transparency.

[Fig. 44] has a 50% transparency. The faces are still very similar, the nose has a slightly different bend in it, also the mouths have a different expression. If this was presented as a single face from an image it would be difficult to even see the overlay it is so close.

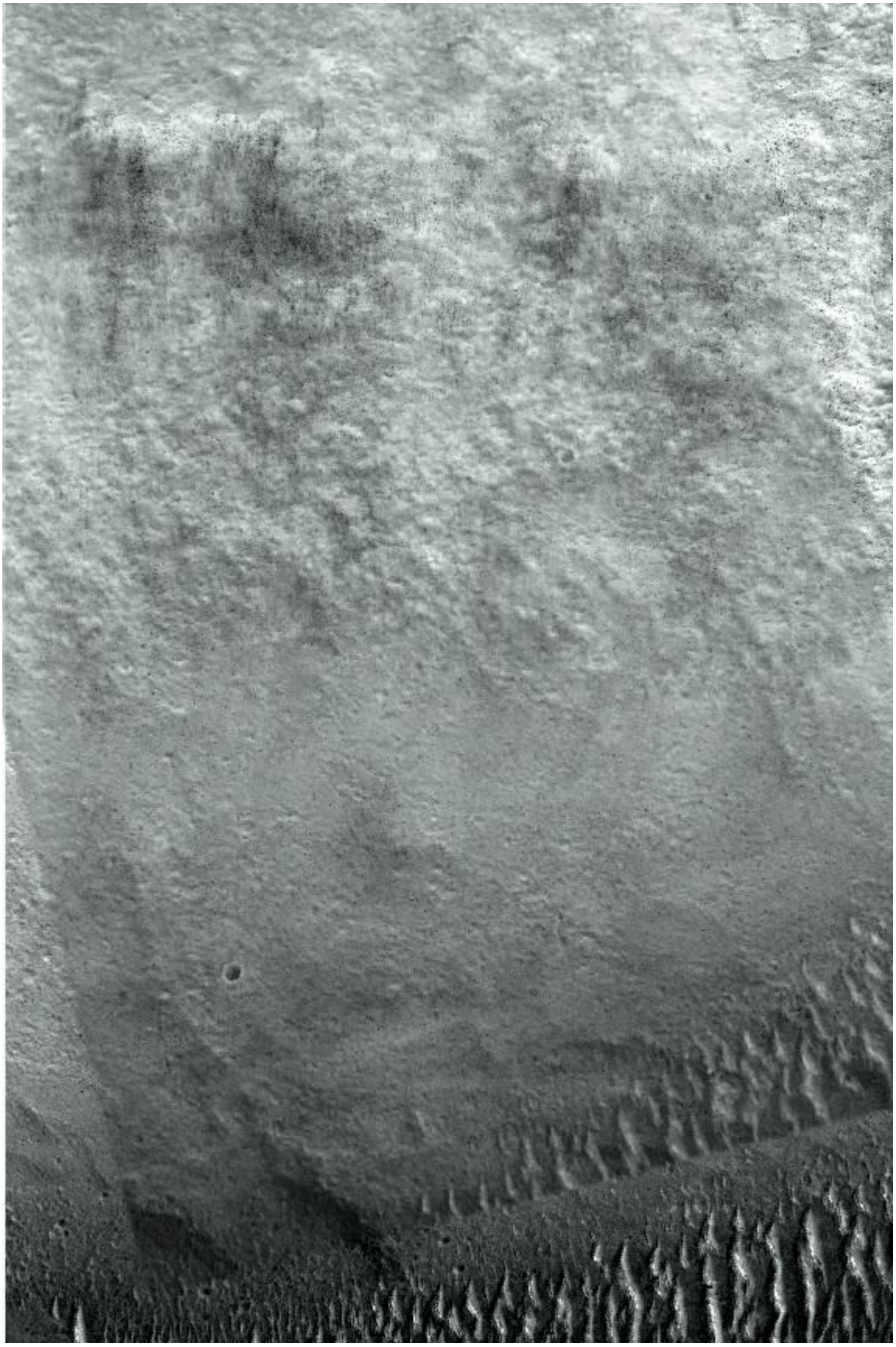

Figure 44. 50% transparency.

[Fig. 45] is at 60% transparency. The 2 eyes have merged so they appear like a slightly different face. An overlay can give additional insights into what these creatures looked like.

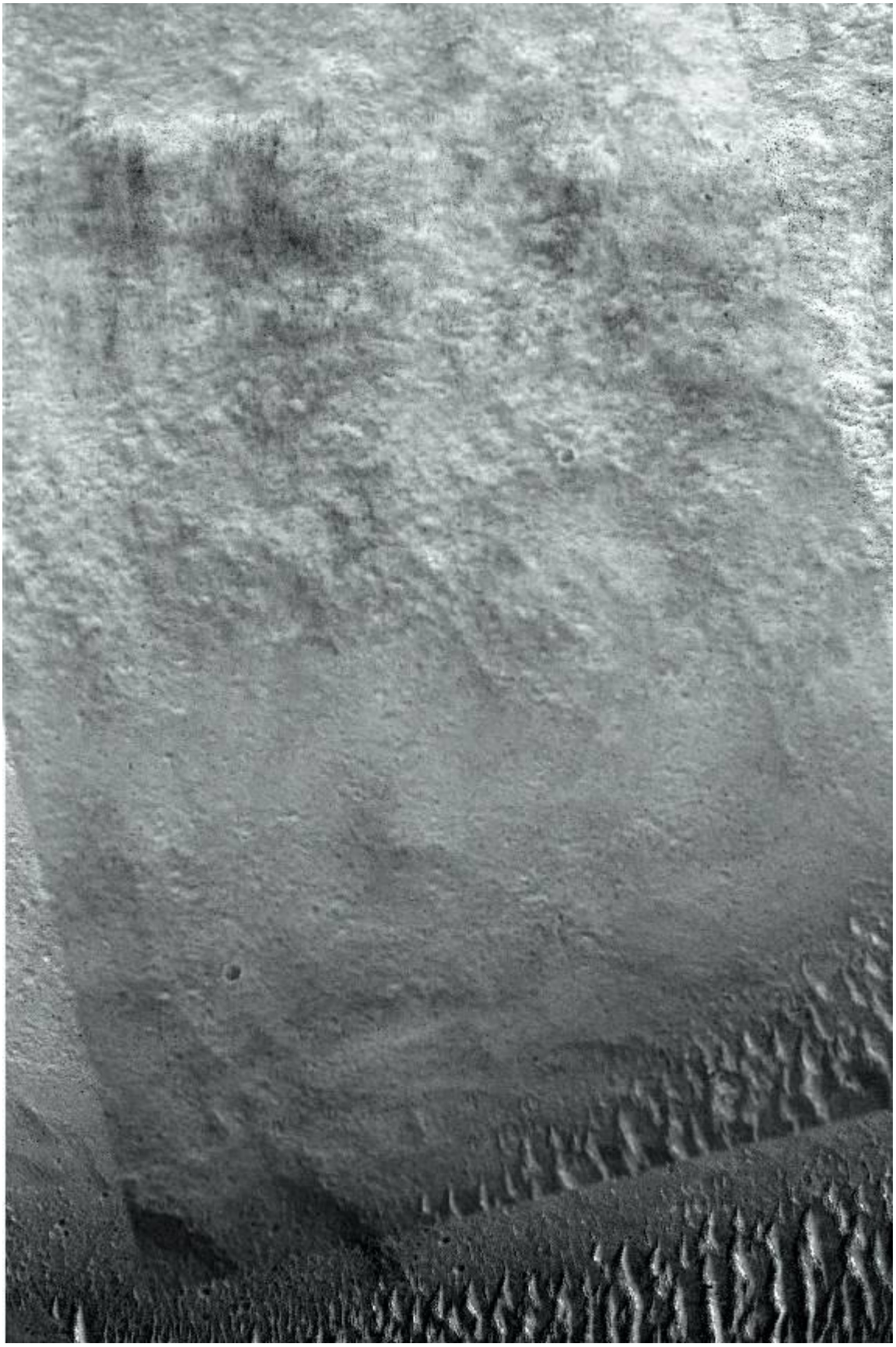

Figure 45. 60% transparency.

[Fig. 46] has a 70% transparency. Face 3, also known as the Angry Face, is becoming clearer. This was shown in [4] where the overlay is arguably closer than could be done by taking random human faces. There is then less variation between these two faces than there is between human faces. It is probably representing the same creature with different moods or whatever these facial expressions represent. It starts out then as smiling then gets progressively angrier looking, this would happen as the two kinds of facial expressions merged into each other.

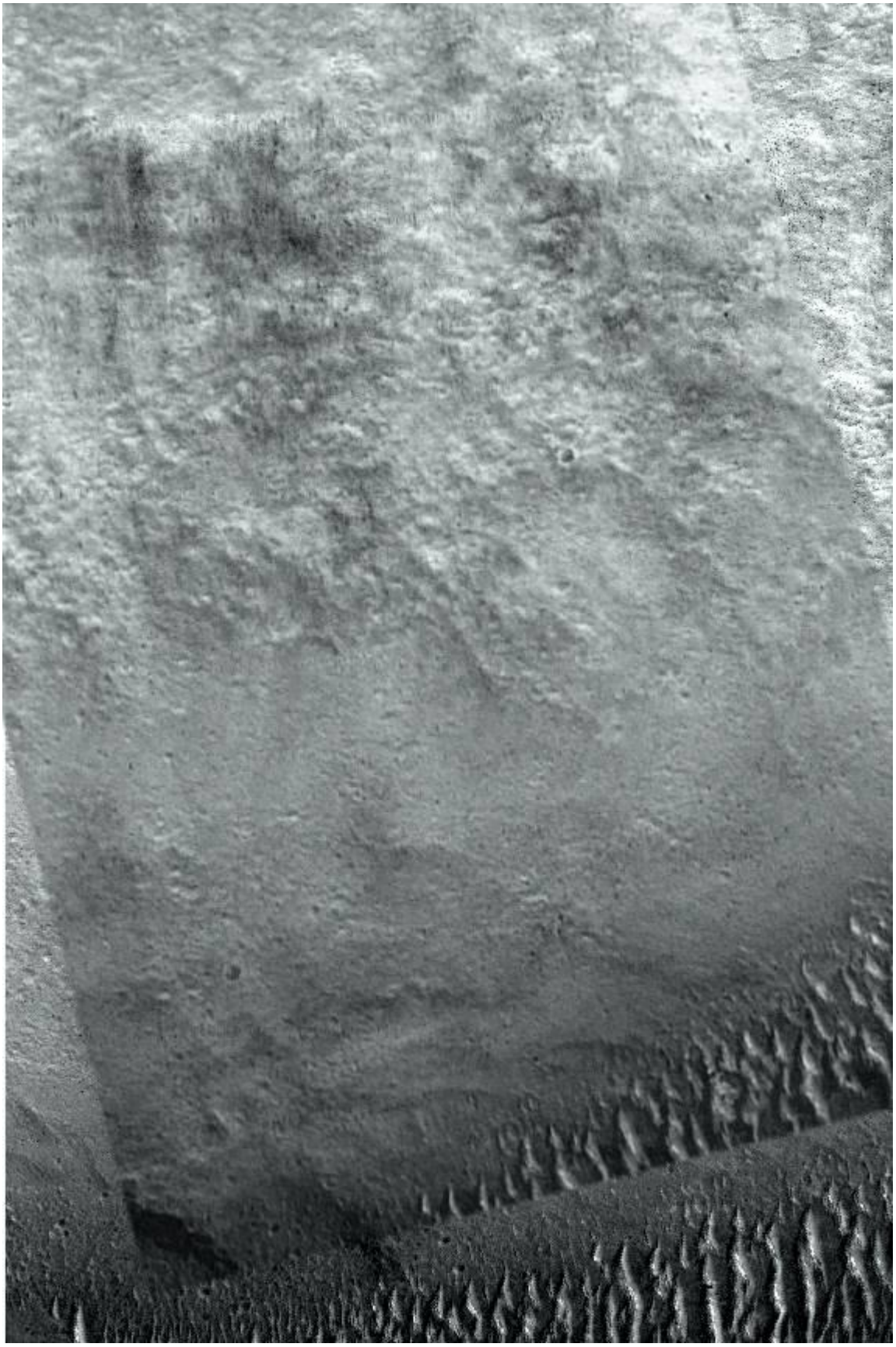

Figure 46. 70% transparency.

[Fig. 47] is at 80% transparency. This is mainly the Angry Face, the overlay progresses from the more equivocal Mona Lisa like smile of the main Crowned Face to the angrier expression of Face 3. It then gives shades of emotional expressions as the overlays change. We don't know what these changing facial expressions actually signified, however on Earth we can usually recognize happy or angry expressions in many animals. If the DNA was similar enough for these faces to be recognizable then this may have carried on into similar emotional expressions. In animals, similar emotions are caused by using the same hormones and genes for many functions, adrenaline for example is commonly used with a fight or flight reflex. When one animal eats another it makes sense for these similarities to be maintained, a predator might use the adrenaline or parts of it from the prey they devour. Because this is related to fight or flight it can be connected to both predator and prey. With panspermia then there may have been enough genetic exchange between the Earth and Mars for similar emotional responses to evolve on both planets.

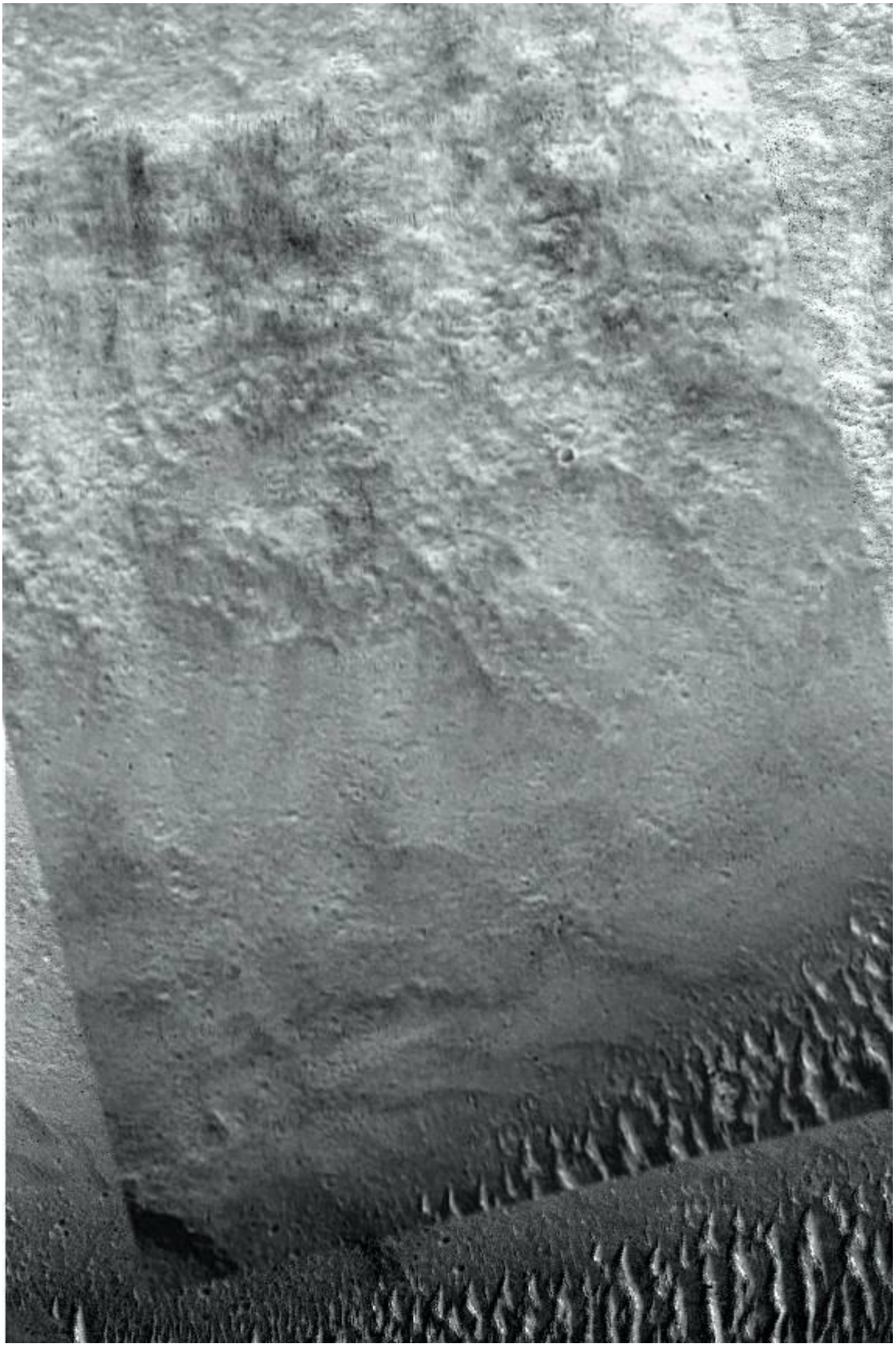

Figure 47. 80% transparency.

A ground view of the Crowned Face

In [Fig. 48] below the Crowned Face is adjusted to be viewed from the opposing cliff. The face may be a little too wide but this depends on the shape from shading algorithm in Google Mars. Also, we do not know how wide the creature's faces were, this problem occurs in each face which has its viewpoint changed like this. If these were designed to be viewed from above, then putting them on angled valley walls would have been pointless. It would have been more logical to place them on a plain, even the Nefertiti formation might have been viewable from the other side of the gulley it faces.

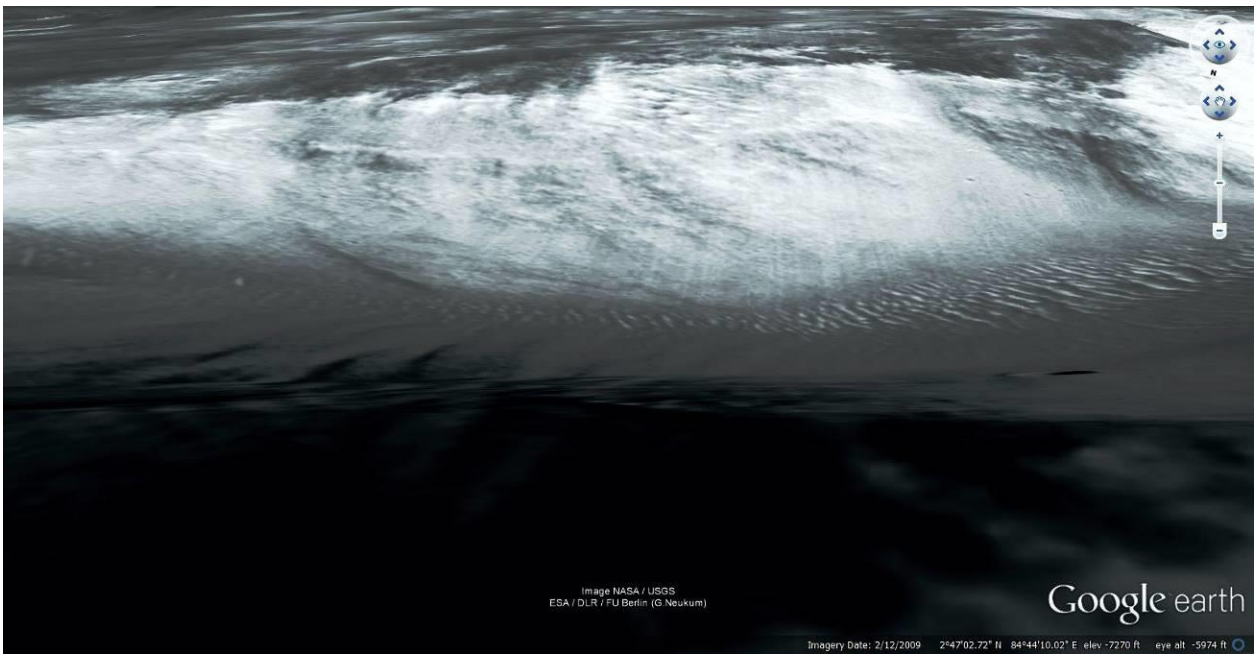

Figure 48. The Crowned Face from ground level.

A possible dumping ground

The idea of a dumping ground of materials used in the construction of artifacts was raised in [4], however it was part of my searching in the Viking images around Cydonia even before the Mars Orbital Camera images. It represents then a way to distinguish chance formations by looking for these materials used in their construction. Leopold and Langbein [2] discuss how entropy in a river system grows with the uniform distribution of energy. The ejecta of a crater is also an increase in entropy as the disorder caused by the meteor impact creates a random ejecta pattern.

[Fig. 49] shows a pile of rubble partially in the crater shown. In [4] I proposed this was an ancient dam from a Mars Orbiter Camera image, but this was shown in the HiRise images to be a trick or light and shadow. The dark lines of soil running out of the rubble appeared from another angle to be like the shadows of a dam wall. It is then a cautionary tale of mistakes made in extrapolating shapes from low resolution images.

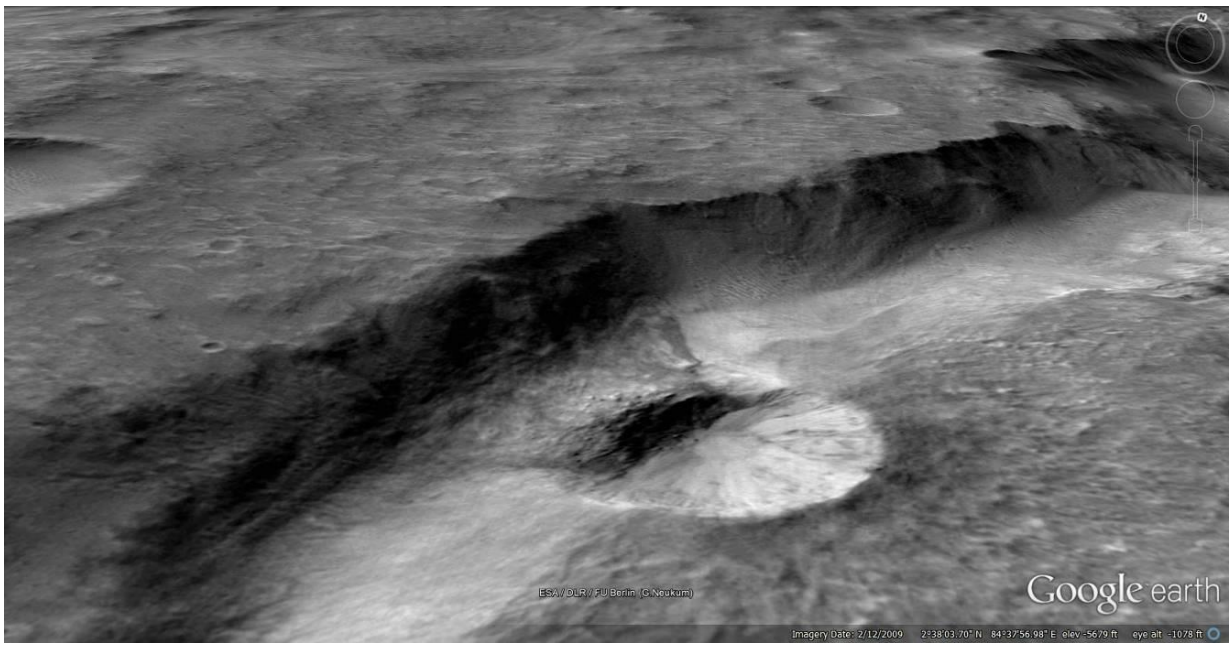

Figure 49. The rubble is in the central crater.

However, the pile of soil is hard to explain naturally. It is not ejecta because it is on one small part of the crater, also there are no large craters from which ejecta consistent with this rubble could come from. In [Fig. 50] below the only crater nearby is shown, it has no ejecta rubble anywhere else and is not a typical crater to be putting out ejecta like this. In terms of entropy the rubble goes against the flow of water forming the valley, whether by a fluvial flow or groundwater sapping. To create a rubble pile energy must be expended to move rocks off the ground, conversely entropy would increase as these rocks eroded away into sand or fell back onto the ground. The crater experienced higher entropy in its formation, however some low entropy expression of energy caused this rubble pile to obscure part of the crater wall. If it was ejecta from another crater, then the random nature of an impact would not concentrate it into one pile. Also, there is light and dark sand under the rocks, some has leached out as if from rainfall. This shows the normal direction of entropy returning the sand to a more random state. There are no indications of a more uniform energy process that would build a mound of rubble like this, or would make the pile larger.

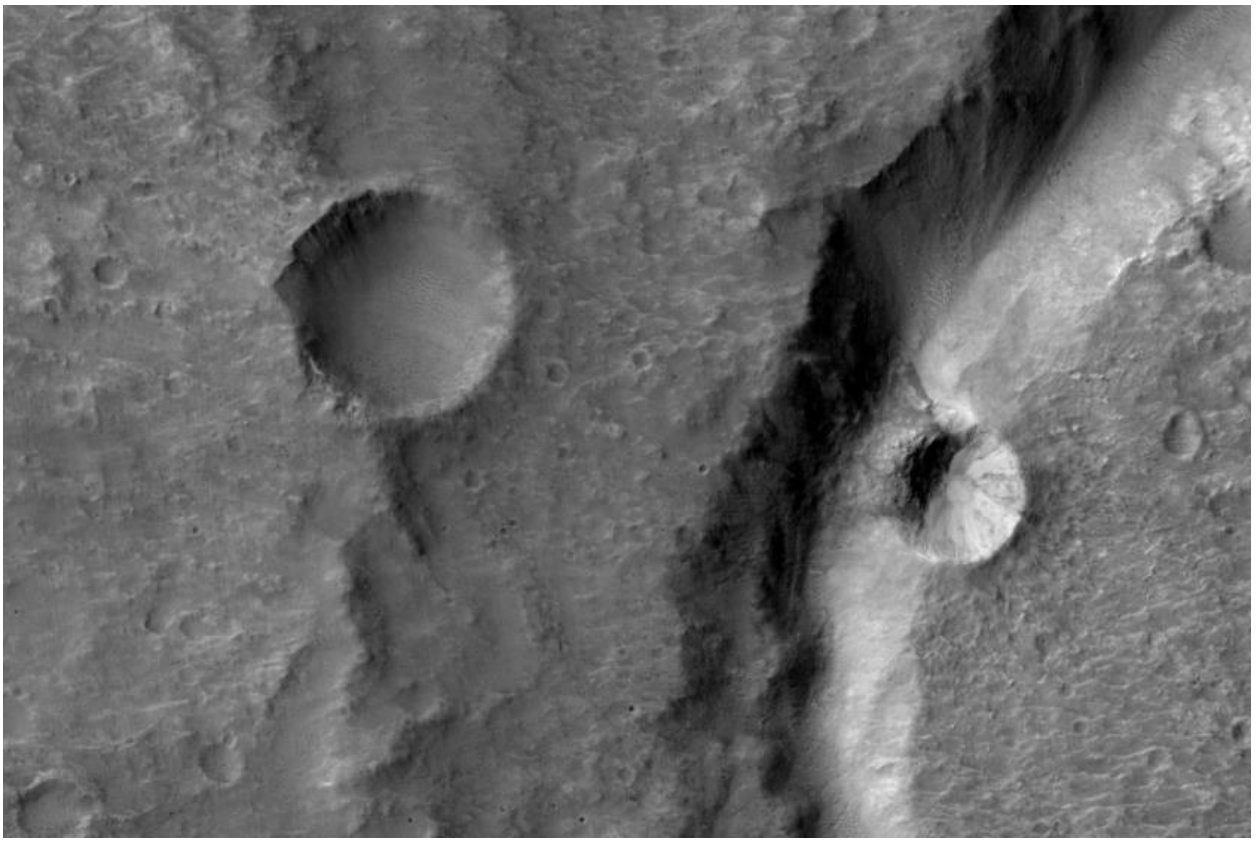

Figure 50. No ejecta from the crater on the left.

The right-hand crater also appears to be newer and so could not then be under the ejecta from an older crater. There is little sign of erosion in the valley degrading this rubble, the dark streaks may have come from ancient groundwater leaching out some minerals.

The rubble also does not appear to be a dune that could have blown here and could blow away because the rocks are too large, there are many small dunes in the King's Valley unlike this formation. It looks like a pile of large rocks, what someone might have left from constructing the Crowned Faces. They would not need to take the soil very far, just outside the face area like this is. Assuming any visitors to the valley came from the paleosea in Isidis Planitia [Fig. 51], then this is on the other side of the area they would want to look at. If they came from the paleosea [Fig. 2] over to the King's Valley, then this would also be away from their path. Putting this rubble in the valley then is problematic if visitors would come this way. Nearly all possible artifacts have either been on islands or near shorelines, in this direction there would be no water so there may have been few or no inhabitants coming from this direction.

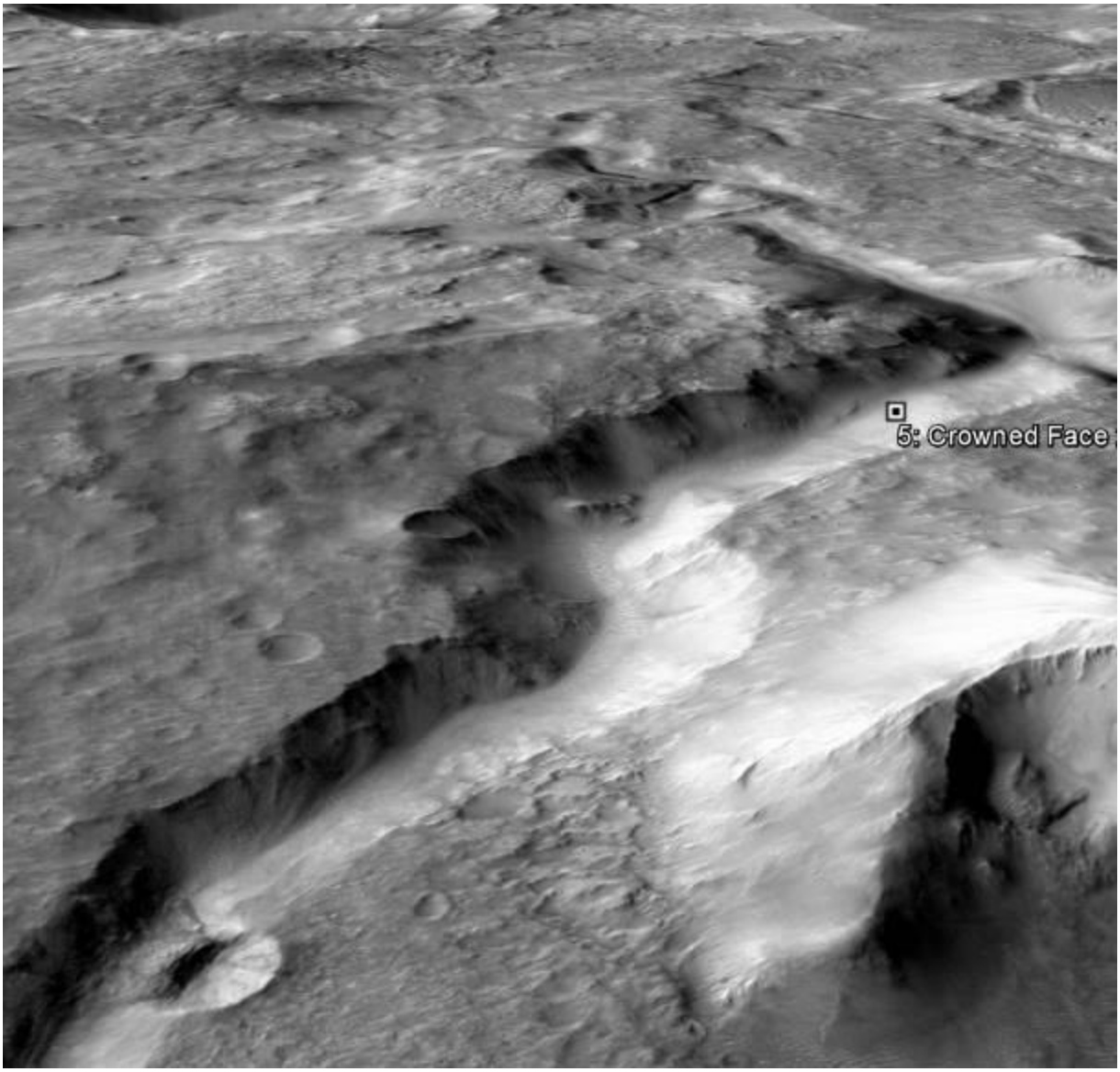

Figure 51. The paleosea would have been on the top of this image, in Isidis Crater. The paleolake would have been to the right.

As shown below this soil partially fills the crater, ejecta is not going to bounce back and land in a crater so it did not come from here. The rubble is so large it would almost fill the crater, it could not then have come from there but seems to be only in this position. There are no piles of rubble like this elsewhere in this valley or anywhere else in the Libya Montes images.

[Fig. 52] is from HiRise; it shows the dark soil more clearly. It is likely to have been dumped there as well as the larger rocks. This image shows the pile is higher in the middle, it is like dark soil has been leaching out of the pile on the upper and lower sides. The cliff opposite the pile might also have parts cut out of it. It may have supplied material for the artifacts, or it could have been dug out and placed in a pile so some could be used. As seen below there are no dug out areas in the valley wall away from this pile, there are also none in any other part of the valley. It's likely then this rubble came from the cliff or further down the valley where the faces were constructed. Evidence for artificiality need not be a constructed artifact, it can also be the waste left behind that should not be there.

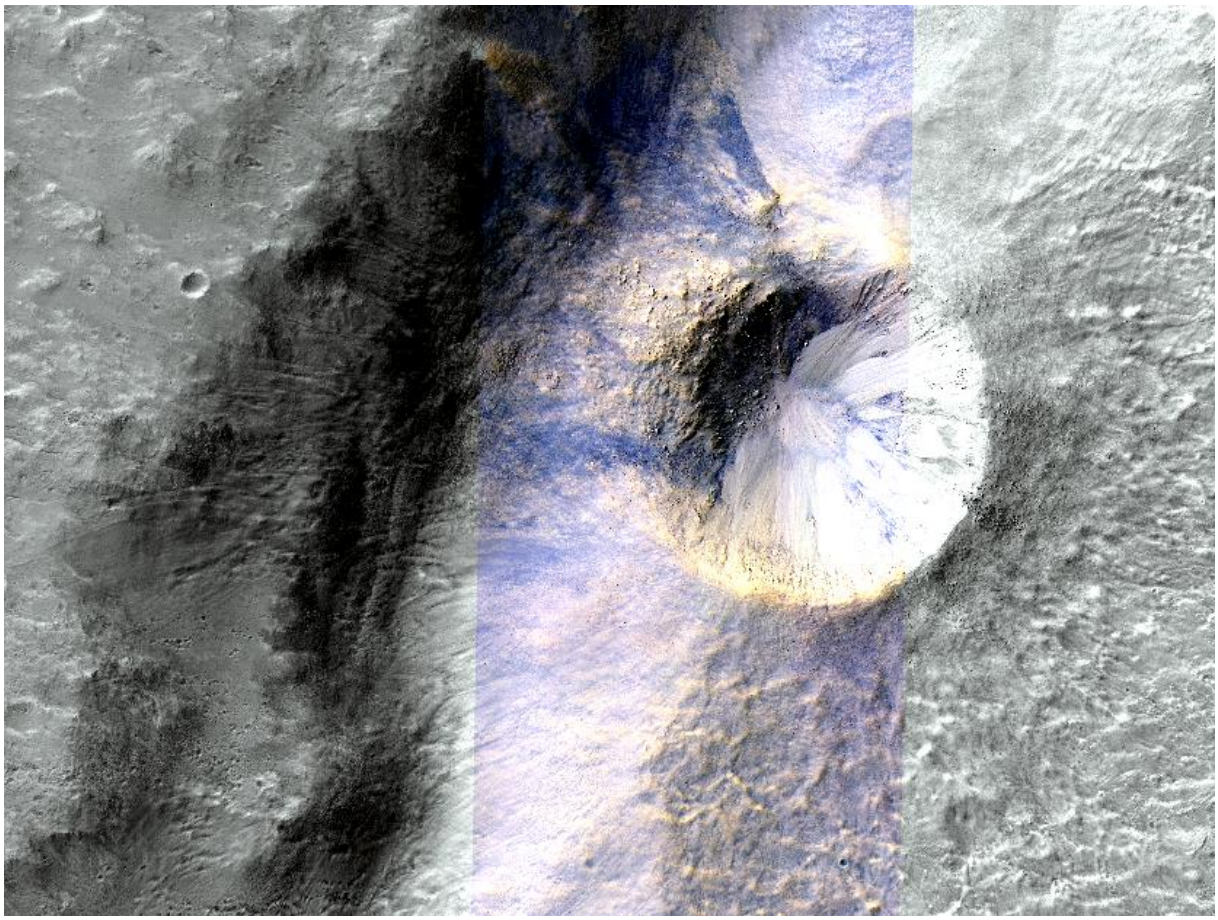

Figure 52. A HiRise color image of the rubble.

In [Fig. 53] many large rocks are on the edge of the crater, some appear to have rolled down the slope. This rubble cannot come from the impact that created this crater, the force is directed outwards. Also, when a crater forms ejecta it expels it in all direction but here it is only on one side. It looks like a pile of rubble which has been slowly settling. It is also a different color to the soil in the crater as well as the soil of the valley, it does not seem then to come from either. There are no other rocks nearby except for on the pile so the rocks do not seem to have come from the soil around it.

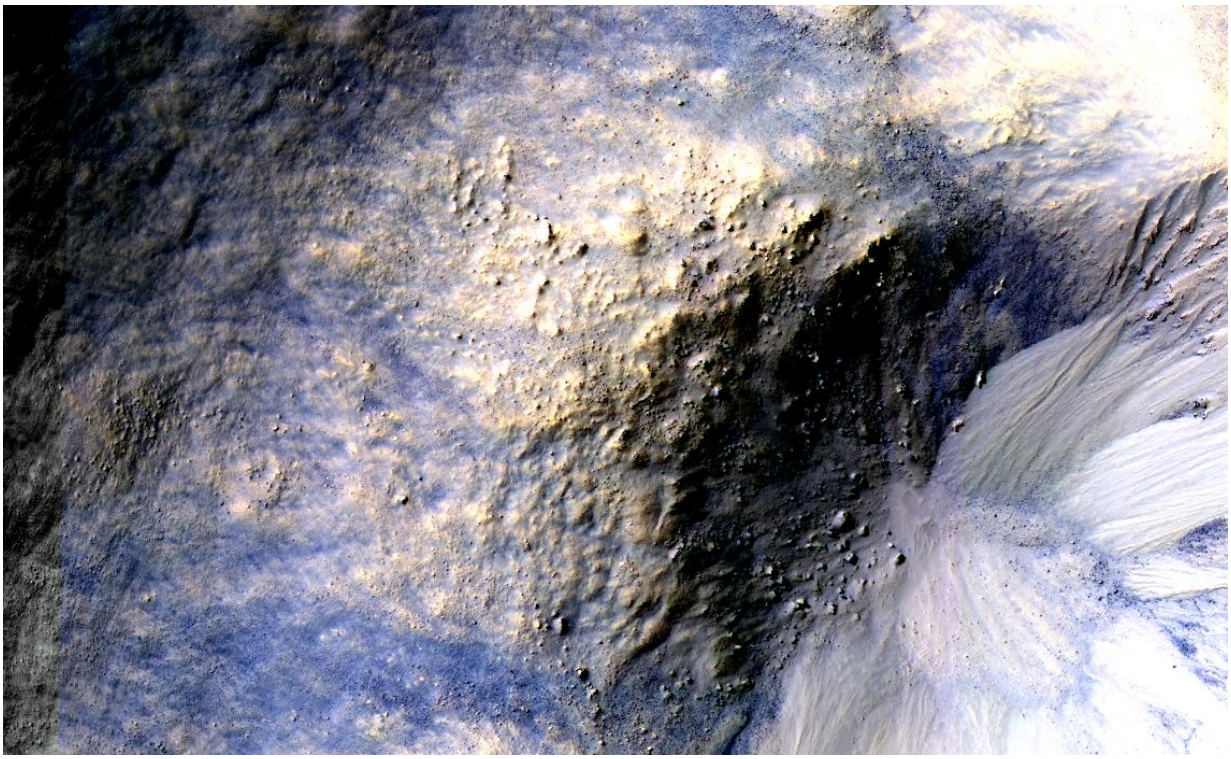

Figure 53. A close-up of the rubble.

Also unusual is the groove shown below [Fig. 54], it seems to have been carved from the hill. It could not form from erosion of something running down the hill because it is at right angles to the slope. It could have acted like a ramp allowing the builders to move materials up and down the hill. In [Fig. 54] one end seems to go all the way up to the ground above the valley. Leopold and Langbein [2] discuss how the uniform distribution of energy relates to increasing entropy, however the ramp shape has a relatively constant width and is different from other parts of the valley wall. The constraint here should be the rock in the valley wall, as the water flow carved out this valley it increased entropy and the randomness of shapes on the valley wall. A ramp like this then would be built by expending energy, a creature might do this with tools such as a pick and shovel. As entropy increased the ramp would tend to be erased to look like the rest of the valley wall, not become more like a ramp. In the same way, a ramp should not spontaneously appear elsewhere as the energy distribution becomes more uniform.

The ramp starts at A in the top right of the image at ground level, the builders would have moved down it along the arrow to the left. Then there appears to be a smaller ramp on the left side with an arrow pointing down. The arrow to the right may be another part of this ramp. The elevations are difficult to see from the image, whether the right end of this section is at ground level or above it. Another use may have been to put materials on this lower ramp from the valley floor, then move them to the left and then back to the right up the ramp to the ground level.

Figure 54. a ramp up from the valley floor.

Also unusual are these grooves running down the slope opposite the pile [Fig. 55], they are not on other parts of the valley wall as seen from either side of them. They may have been caused by someone rolling the debris down the slope. The problem is if something rolled down the slope it must have been rocks, but these are no longer at the bottom of the slope. But rocks cannot just move themselves from the bottom onto the pile of rubble. Soil might also have been poured down the slope burying the rocks but unlike near the Crowned Face there are no dunes at the bottom to hide rocks.

These marks may have been caused by someone dragging rocks and baskets up and down the slope, perhaps with a rope. Some appear then to have dug into the slope like a rope making a groove. There are no other marks like this in the King's Valley.

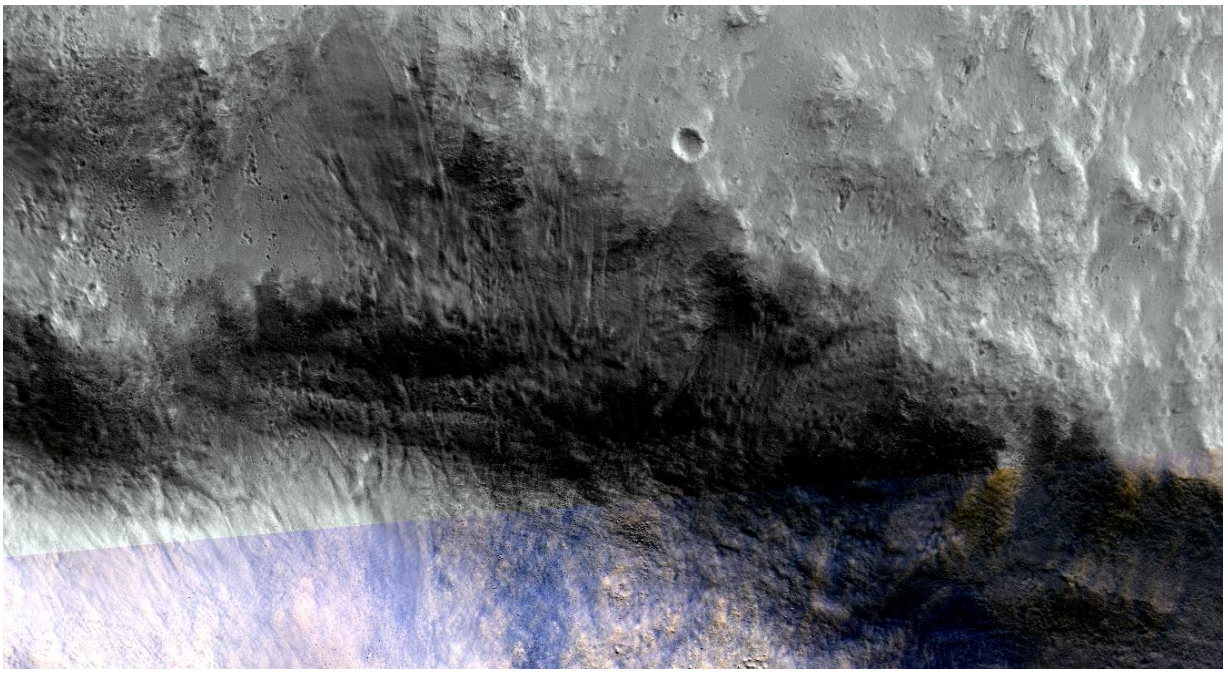

Figure 55. Vertical grooves in the valley wall.

At the other end of the King's Valley there appears to be a cut in the bank, on the left side of the dunes running down the valley. This might also be from taking soil for construction, however this would be along the proposed path for entry so it may be a designed shape. On the right of this is a similar cut which is in the silhouette shape of a Crowned Face shown upside down. This is shown in [Fig. 56] below. Leopold and Langbein [2] discuss how entropy increases with the uniform distribution of energy, however the cuts [Figs. 56 and 57] are consistent with a low entropy carving of shapes against this natural terrain. They are surrounded by the natural shapes that water erosion would provide, experience would suggest over time these cuts would disappear and look like the rest of these images. Conversely increasing entropy should not be cutting the rover bank like this or carving out face shapes.

Figure 56. A possible cut in the wall of the valley.

Next to this is a cleared area like a crowned face, [Fig. 57] now the right way up. This is difficult to explain naturally because the dunes at the right stop on its edge, they should have spread over it too. It is a depression so the dunes should not have been stopped by it. Even this is very hard or impossible to explain naturally, the sand in dunes should move with gravity and not stop on the edge of a depression. This is seen in the bottom part of this face shape where some dunes have crossed into it. If this depression was as old as the valley, then the dunes should be all through it or at least over its upper right edge. To see that it is a depression there is a small crater to its upper right with the shadow on its right edge. This is the same side as the right edge of the face shape, hence it is a depression. The cut bank is on the other side of the dunes, on the right.

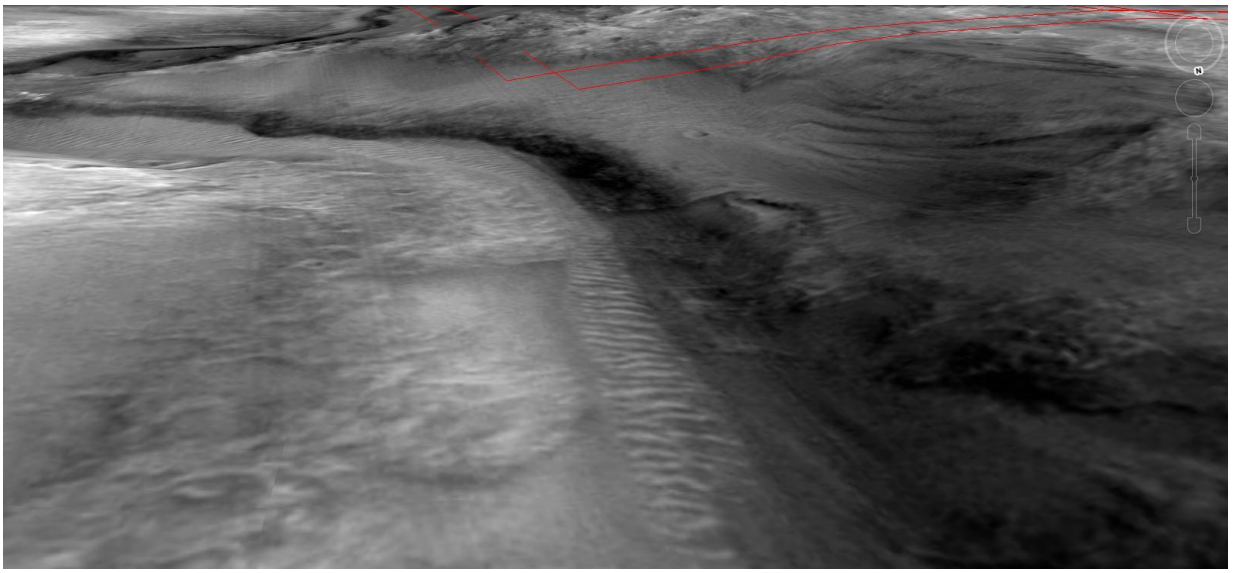

Figure 57. A crowned face-shaped depression.

The jetty structure

In [Fig. 58] the Crowned Face is shown at the bottom, at the top is a jetty shape. This appears to be where the paleosea began as shown in Figure 4, the terrain is much smoother and it appears like a shoreline.

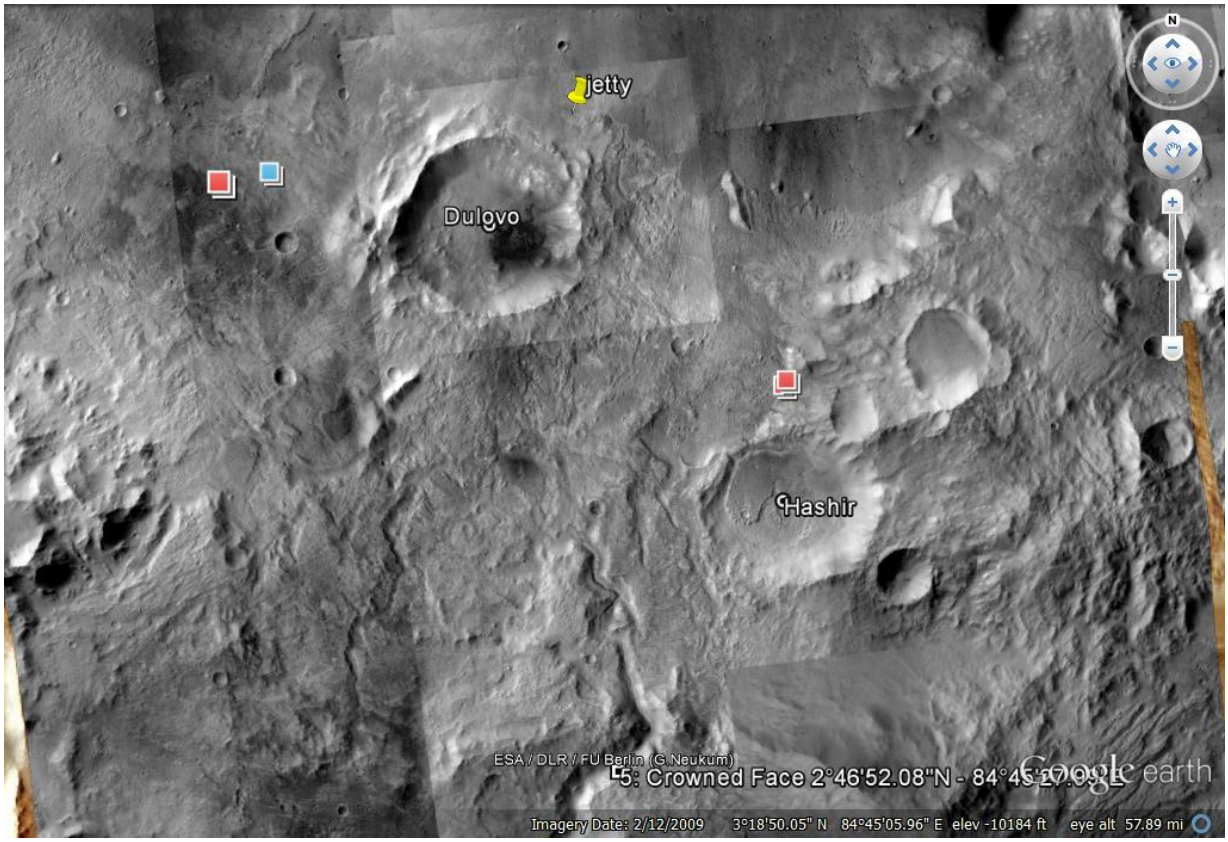

Figure 58. The jetty to the King's Valley.

In [Fig. 59] below this shape is found in a HiRise image ESP_019357_1835. It may be an imprint from a former organically based structure like a wooden jetty. It is virtually exactly where someone would walk to from the King's Valley entrance to get to the water in the shortest path.

Figure 59. A close-up of the jetty shape.

[Fig. 60] shows how this jetty shape is partially in the red rectangle of the HiRise image. There is no clear path from the jetty shape southward like a road or steps, however there are some smoother areas and the path would not be difficult. A trail might be buried under the sand.

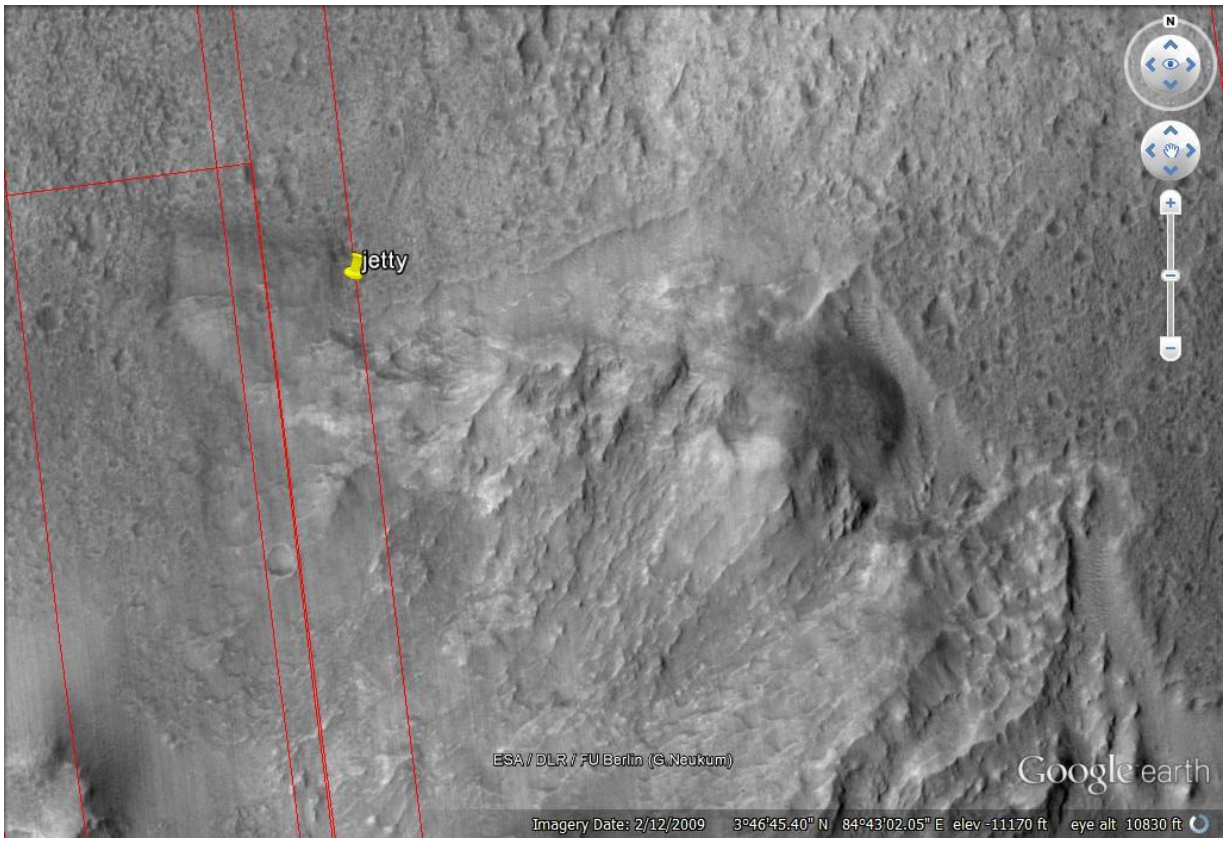

Figure 60. The jetty shape on this coastline.

[Fig. 61] shows an adjacent square shape, perhaps another part of the jetty. It would indicate these were made of organic materials since they would have completely disappeared leaving a hollow. It can then be other buildings may have used organic materials, perhaps explaining why few are seen now. An imprint like this then can imply some formation was there that disappeared completely, this can give insights on possible kinds of construction. Just below this is a smoother area where someone could have moved from the jetty and this shape to the right and then south. This path is marked with the arrow pointing right, the second indented jetty area is marked as A.

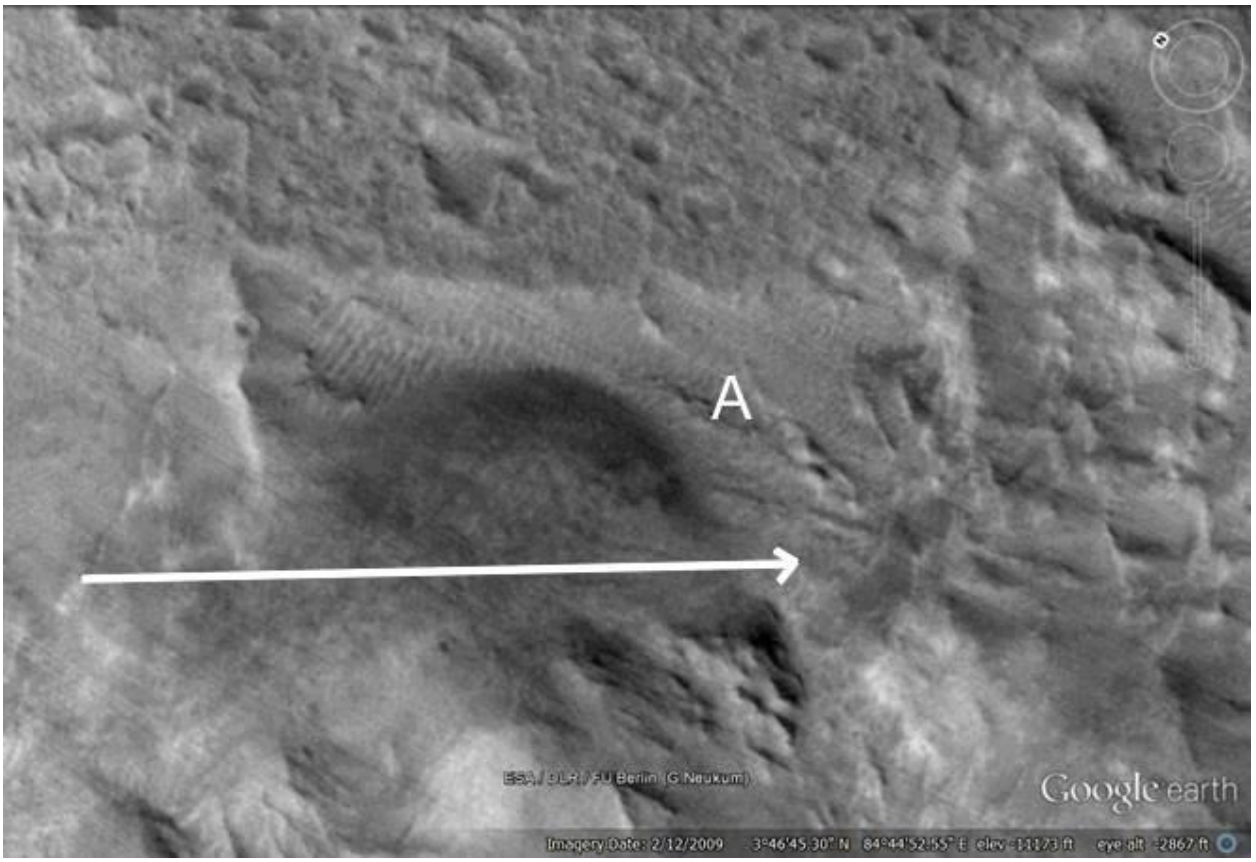

Figure 61. A second jetty shape.

[Fig. 62] shows the jetty shape is directly in line with the Large Face, travelers could then have moved directly from left to right here and then seen the Large Face from a cliff top.

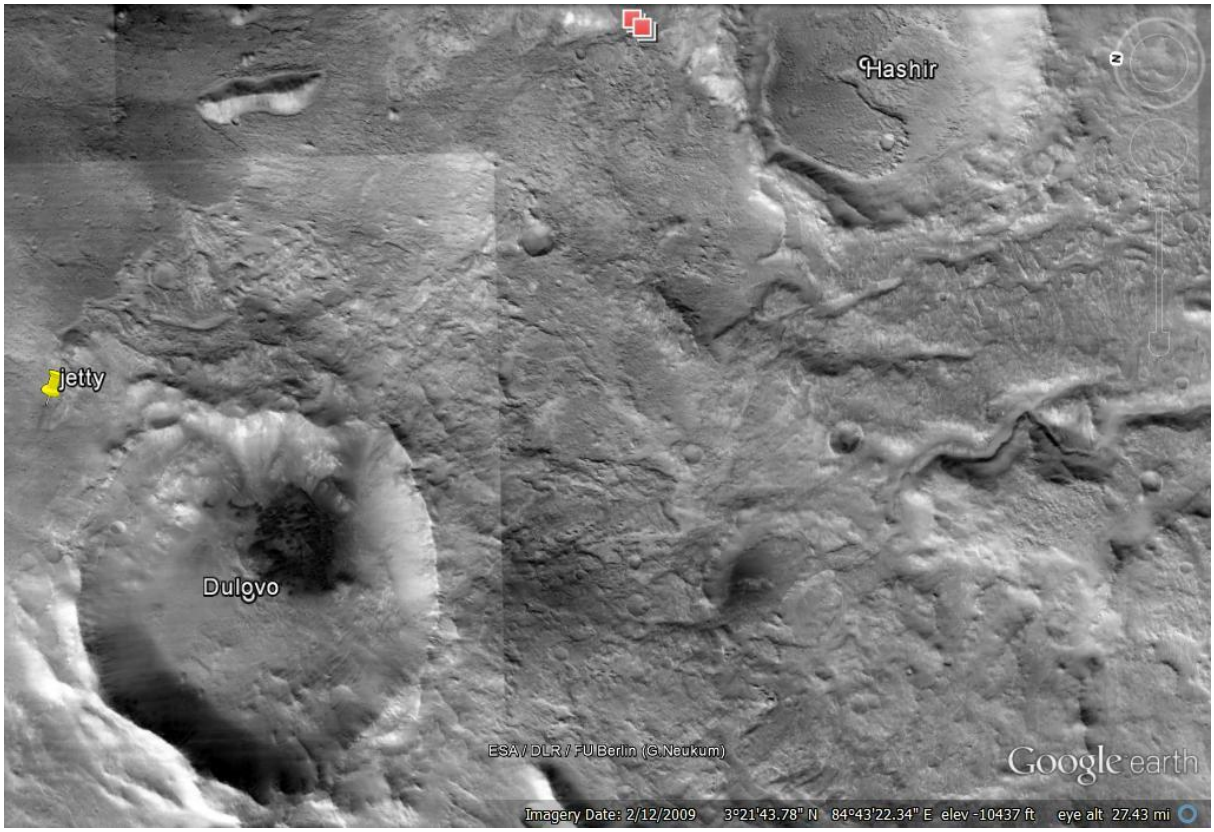

Figure 62. The jetty compared to the Large Face position.

In [Fig. 63] the straight line shows a bird's eye path from this large face to the King' Valley. This indicates how the jetty shape is the nearest point on the coast. A possible path is shown as a series of lines following the lower areas, then past the Large Face into the main face area. Alternatively, visitors could have come via the paleolake in [Fig. 2].

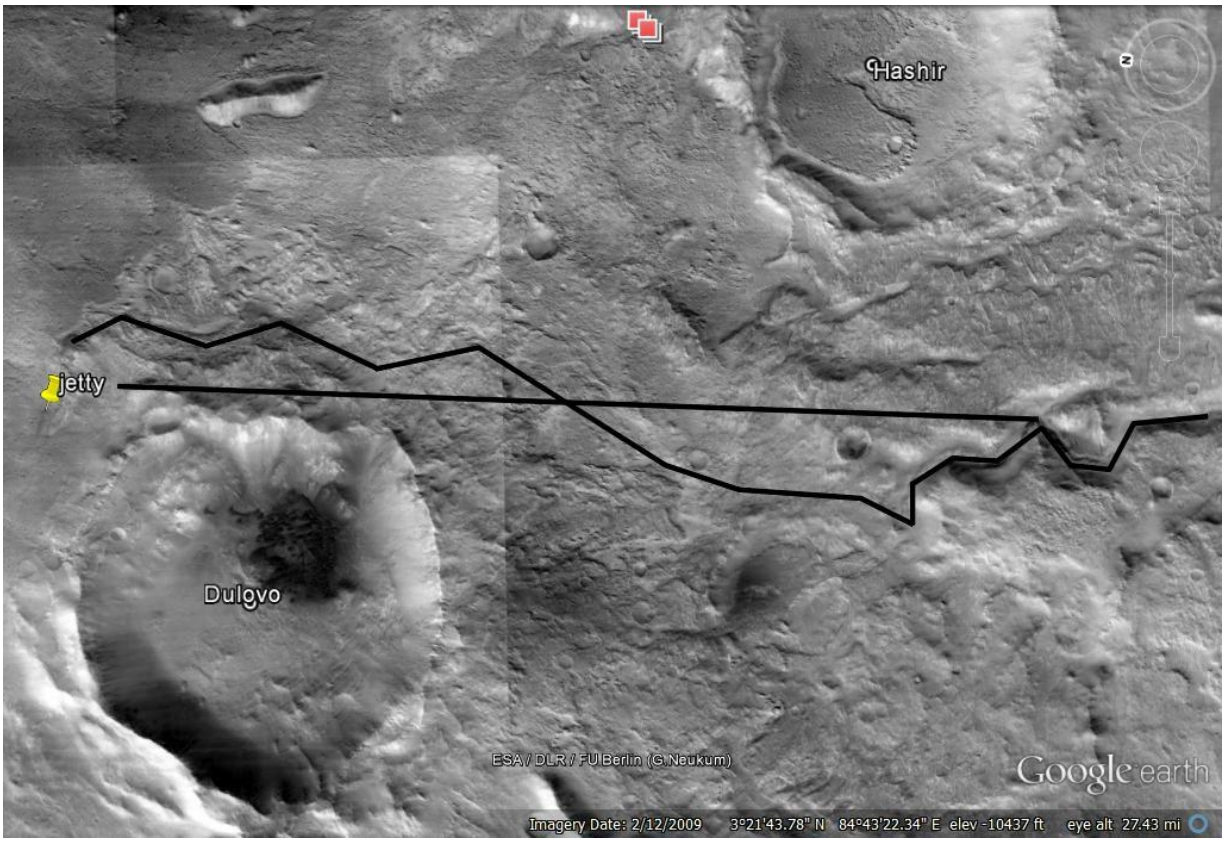

Figure 63. Two possible routes.

In [Fig. 64] is another image of the jetty shape from a CTX context image, it appears clearer with different shadows.

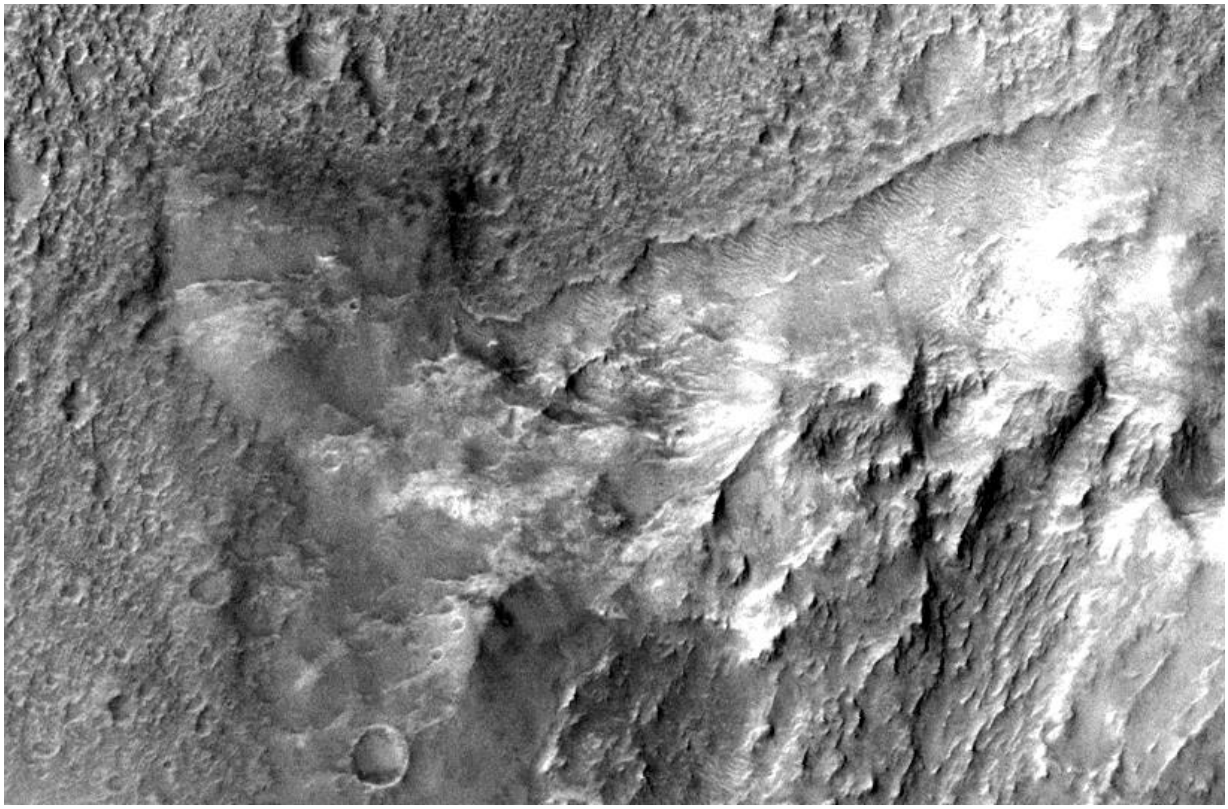

Figure 64. Another image of the jetty shape.

[Fig. 65] shows an outline of the main jetty shape, north of this would have been the paleosea.

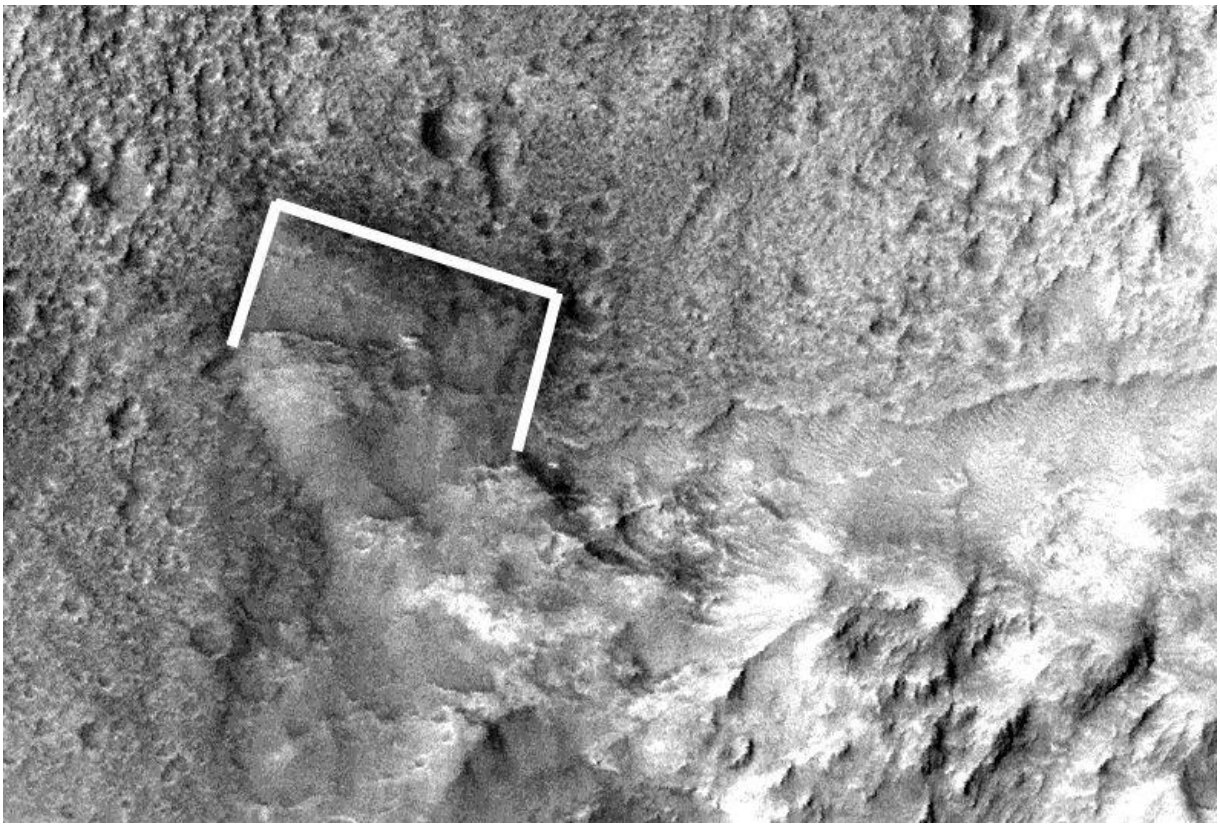

Figure 65. The jetty outlined.

The Large Face

[Fig. 66] shows a CTX context image of the Large Face shape. This would have been the first face the hypothetical visitors would have seen. They would likely have observed this from the ground so the shape would have been foreshortened. It can also be a natural hill at the fork in the river system. A hypothesis is that someone rearranged some of this hill to appear more face like. Differentiating the face from the natural hill relies mainly on appearance which can also be pareidolia. It represents an a priori prediction that reimaging this formation will make it look more artificial. It also predicts that features will be found falsifying the natural or geological hypothesis that this was formed by erosion.

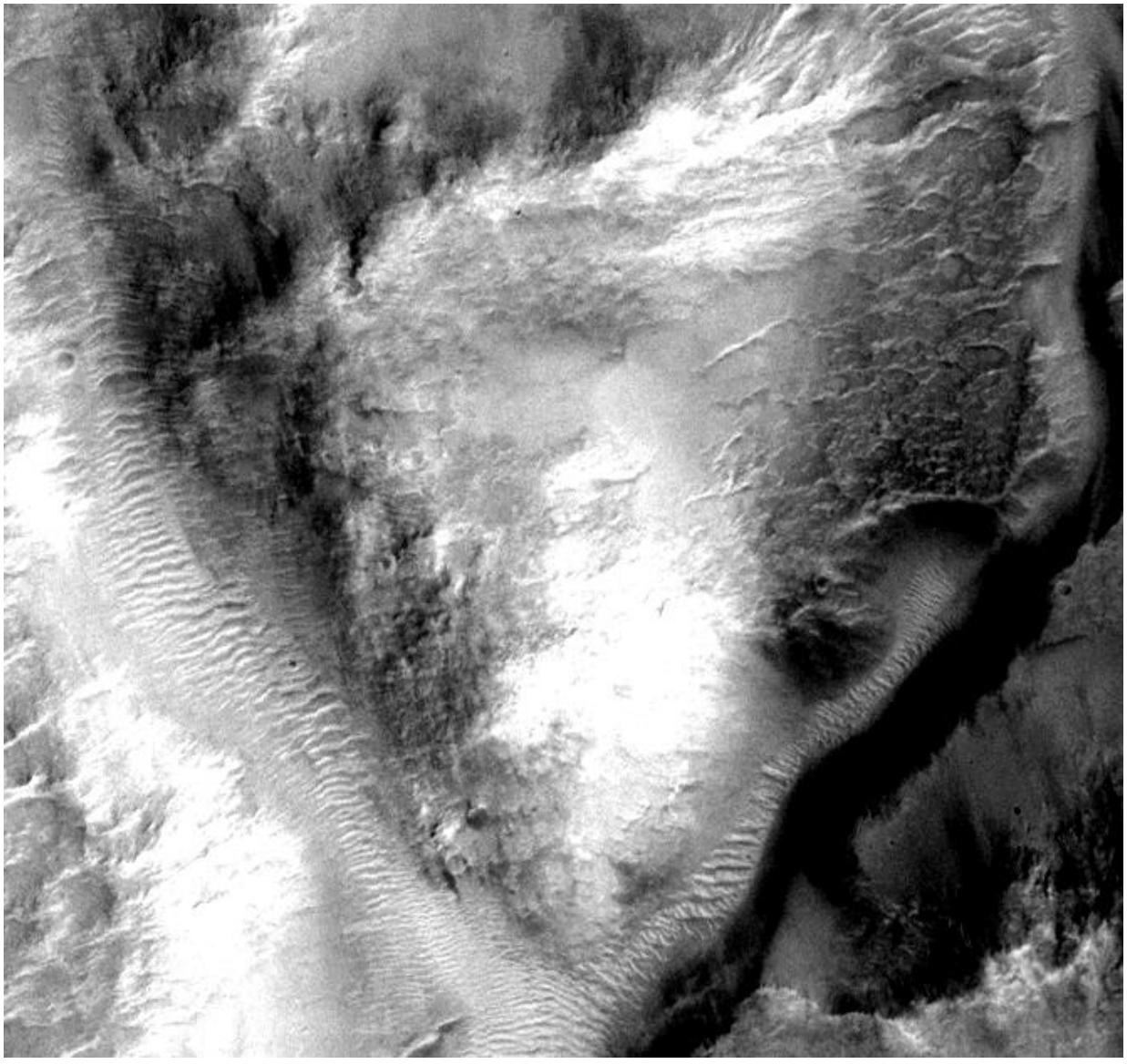

Figure 66. The Large Face.

[Fig. 67] shows possible eyes, nose and mouth. Without knowing the angle of viewing and the exact shape of this hill it cannot be determined whether these features are of the right proportions.

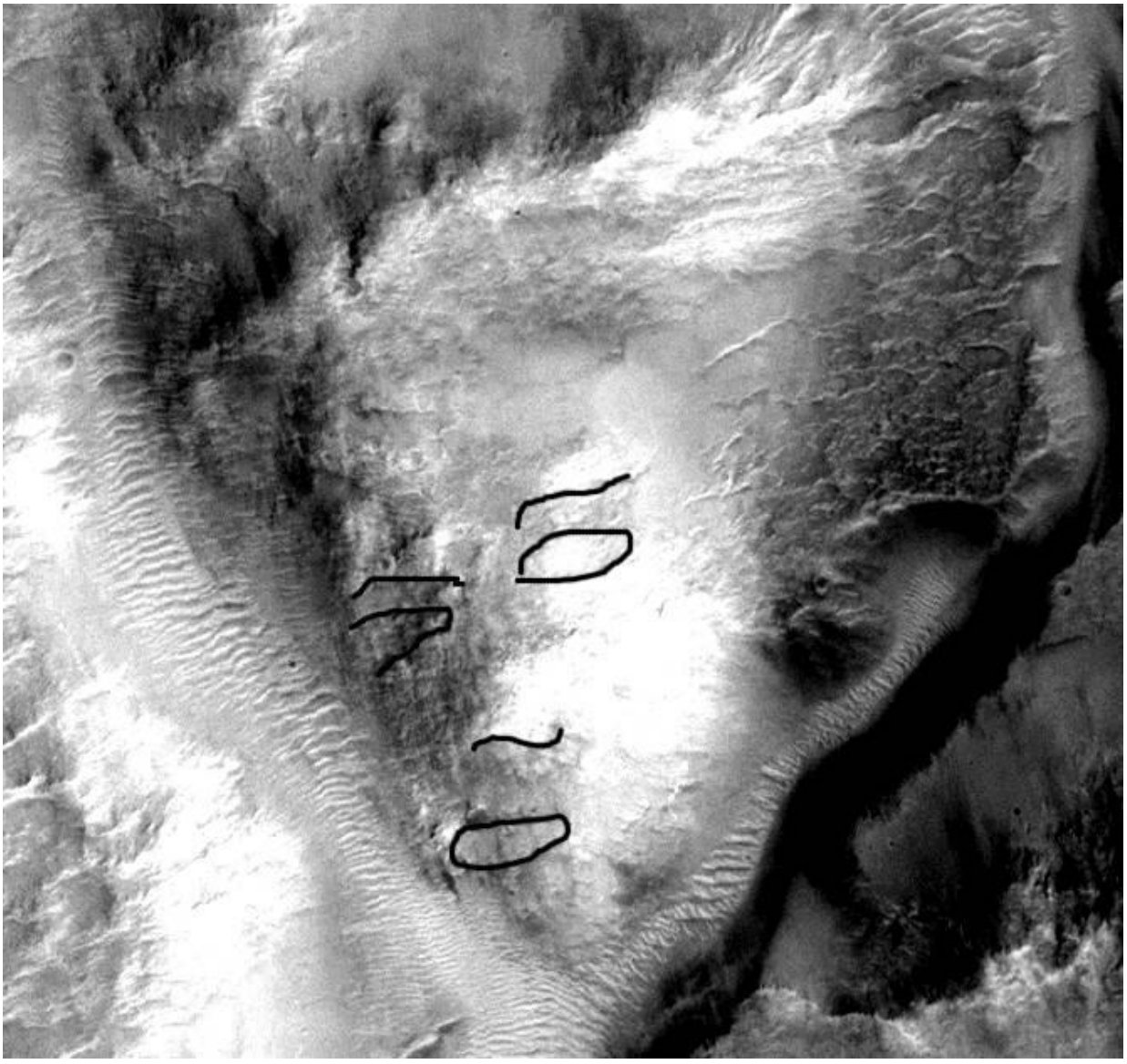

Figure 67. Outlined features.

It is hard to accurately render how this face would have appeared from the opposite cliff. Google Mars has a limited ability to extrapolate elevations from the shape and the shading. It is still recognizable as the face shape below [Fig. 68], however the Meridiani Face and Nefertiti both seem to be made to be seen from above. It is not clear if this is artificial, however the motif of a crown is used so many times in the King's Valley that some modification of this hill would seem logical. HiRise images of this may be needed to resolve this question.

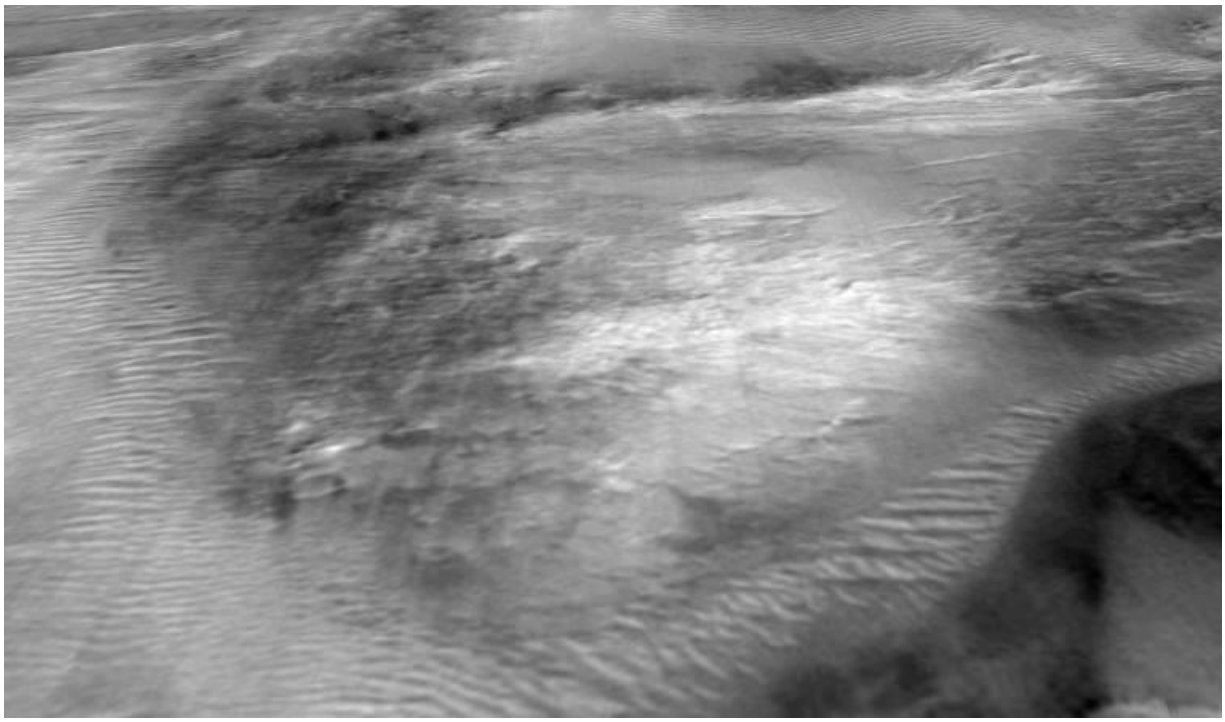

Figure 68. A simulated low angle view.

[Fig. 69] shows another CTX context image, the left eye is ambiguous perhaps because of erosion or the wrong viewing angle. Different images have slightly different shading which makes some features stand out more.

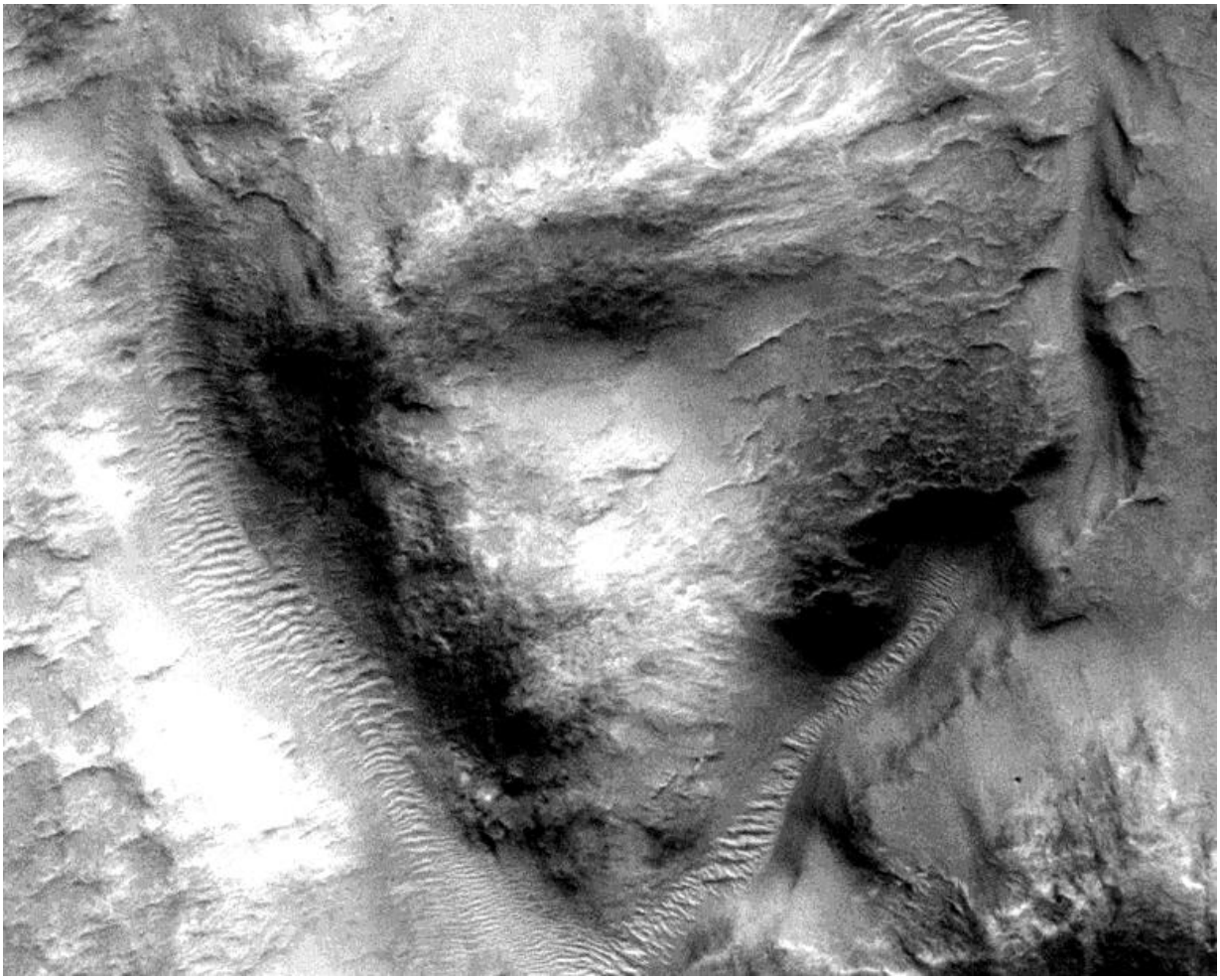

Figure 69. Another CTX image.

[Fig. 70] shows this left eye lower down, perhaps from the wrong viewing angle. The eyes, nose, and mouth appear to be well defined in all three images shown. The left eye can be drawn higher up in its cavity to be more naturally proportioned.

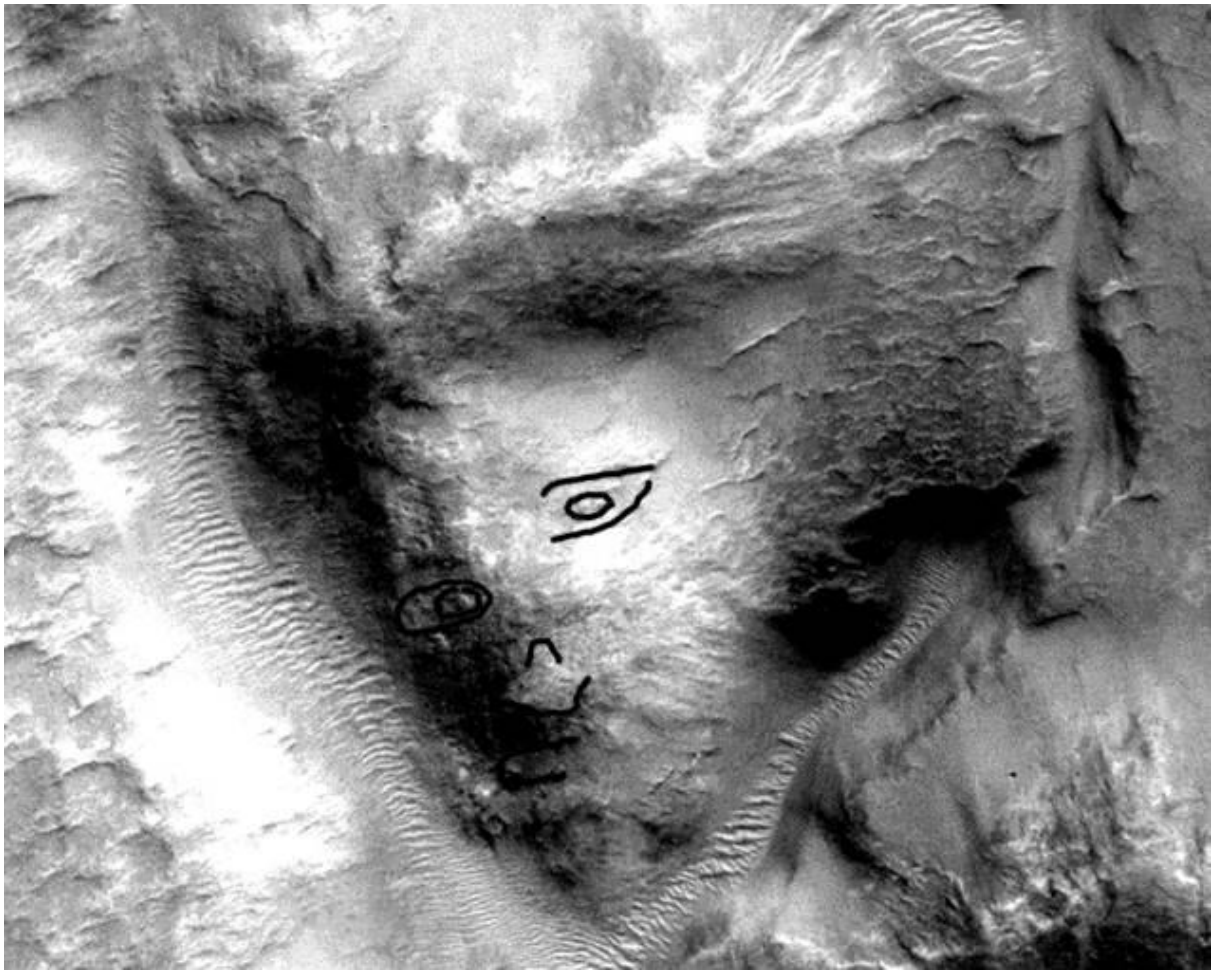

Figure 70. A different left eye position.

[Fig. 71] below has a slightly different angle, the left eye cavity is more visible.

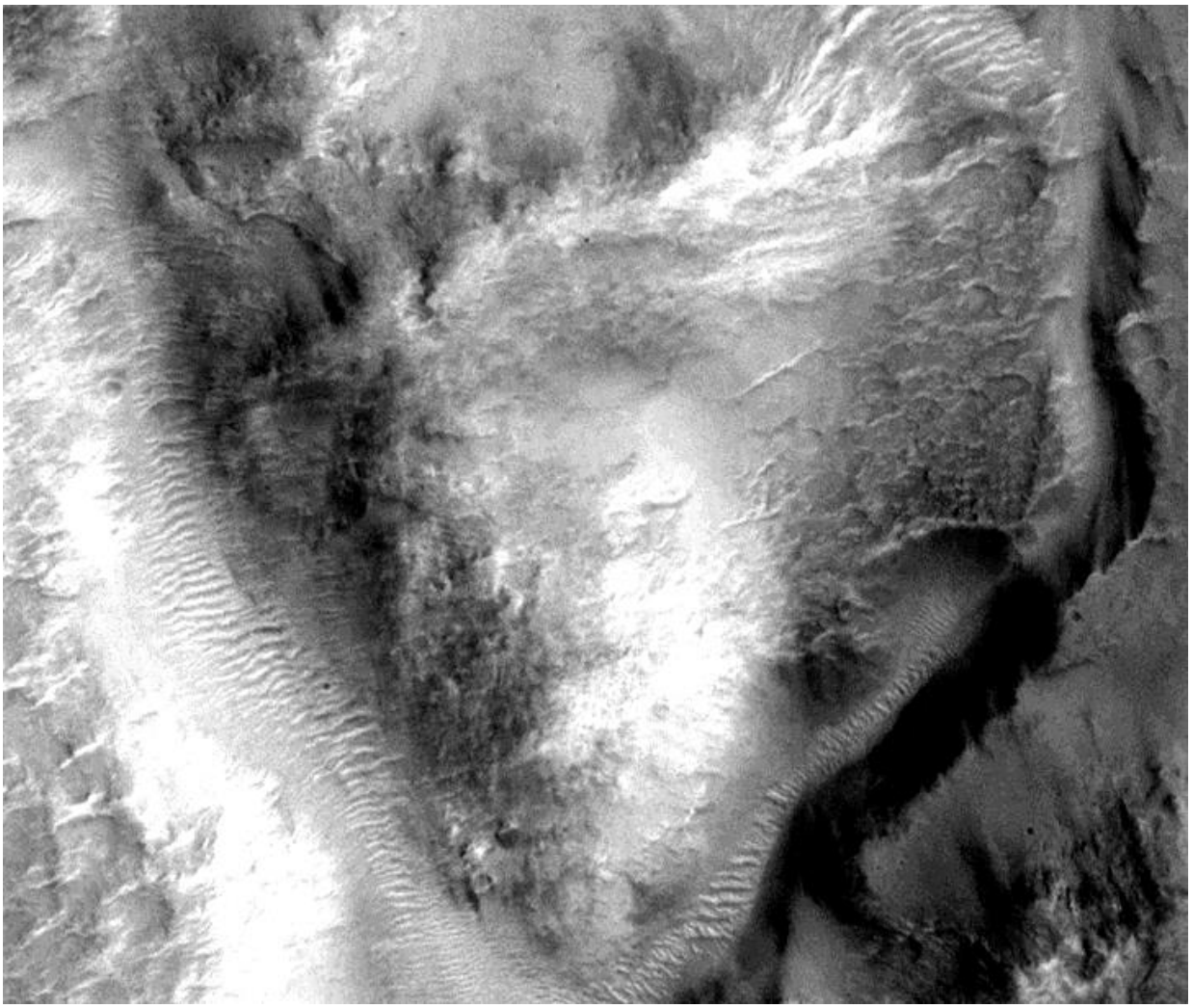

Figure 71. A third CTX image.

The eyes, nose, and mouth are again marked [Fig. 72]. This represents a successful prediction, that these features should be more face like in the CTX images than seen in Google Mars. The left eye is lower than it perhaps should be but this is seen also in the Crowned Face. It may look more in proportion when viewed from the cliff on the left. Overall the left eye is much clearer in these images with a suggestion of a mound in it acting as a pupil. Lips also seem to be more visible, with the crown there is a strong resemblance to the main Crowned Face.

Figure 72 . A third set of face features outlined.

Another interpretation is the eyes would have been higher [Fig. 73], the crown would then begin above the words "eye" and then extend up to the top of the image. To resolve this a HiRise full resolution image is needed.

Figure 73. An alternative set of facial features.

[Fig. 74] shows a square shape on the cliff opposite the Large Face, this may have been a viewing platform. Visitors then may have moved from the jetty to this platform.

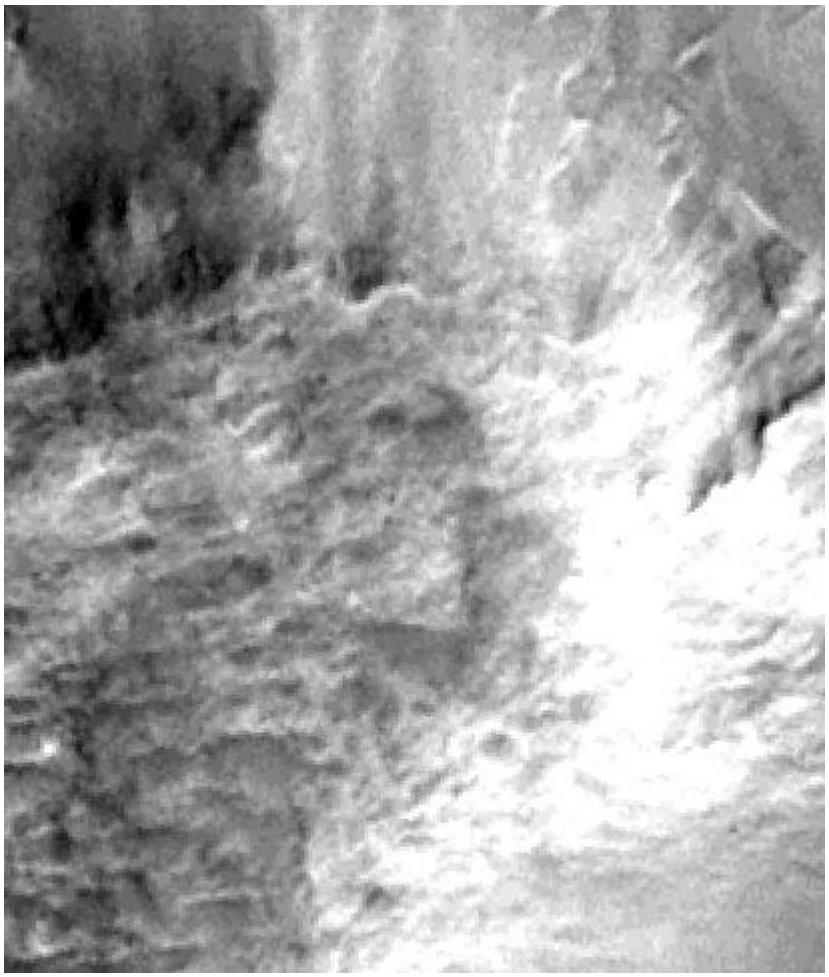

Figure 74. A possible platform.

[Fig. 75] shows this with straight lines, there are no other straight rock formations in this image. The other straight shapes nearby appear to be dunes but this square is not a dune.

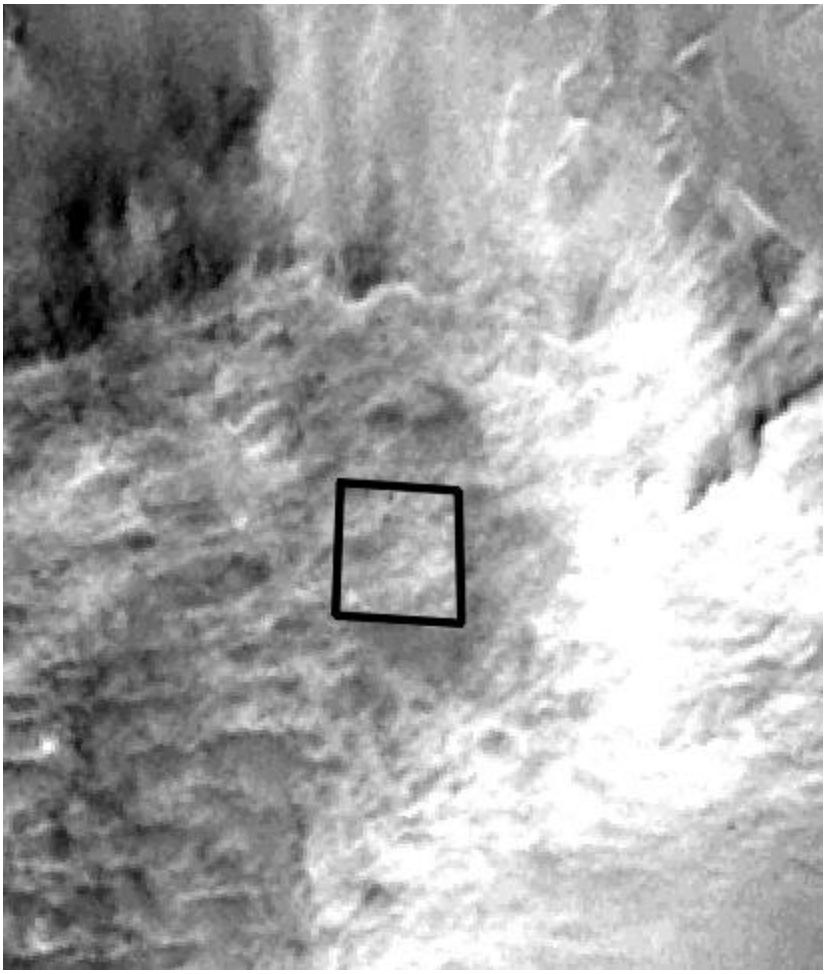

Figure 75. The square outlined.

[Fig. 76] shows the square just to the right of the letter A. This could have been a viewing area for the Large Face.

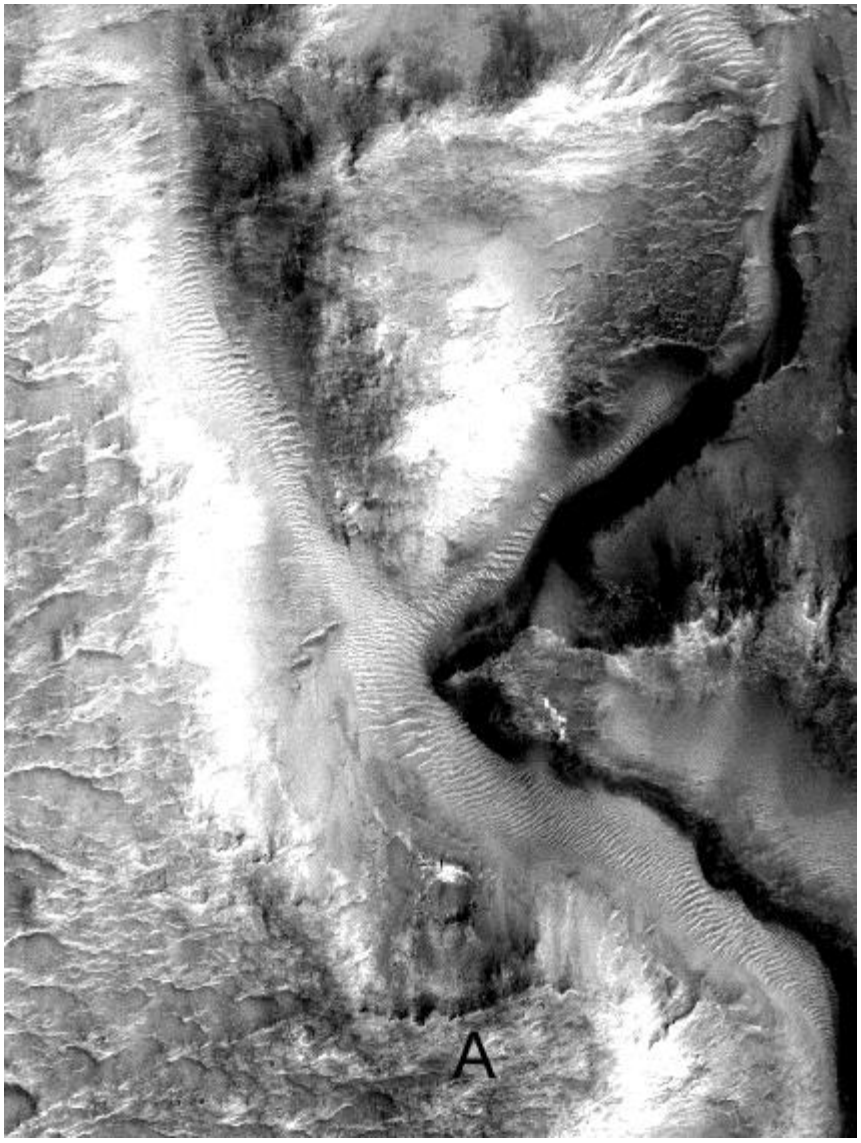

Figure 76. The possible viewing platform and the Large Face.

Face 18 reimaged

Face 18 [Fig. 77] also appears more artificial when reimaged by HiRise. Some of the early faces were numbered for reference in [4]. This is also the face marked A [Fig. 21] the reclining crowned figure is looking at.

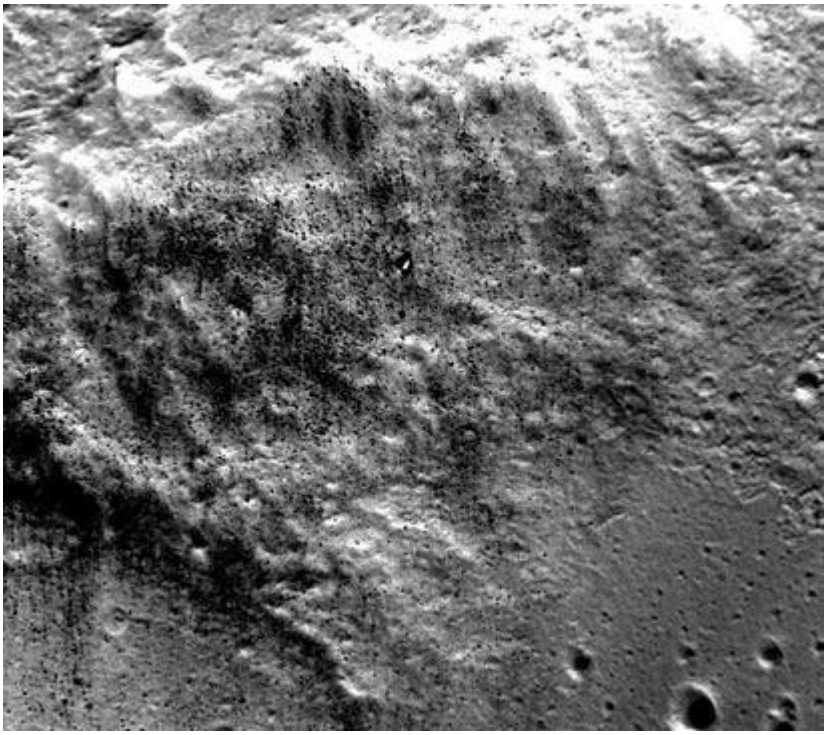

Figure 77. A partially buried face.

In [Fig. 78] **A** and **C** are eye shapes with iris shapes at **B** and **D**. The left eye is lower as with faces 1,2, and 3. **E** is a crown shape similar to the previous 4 faces. **I** is a jawline like Faces 2 and 3.

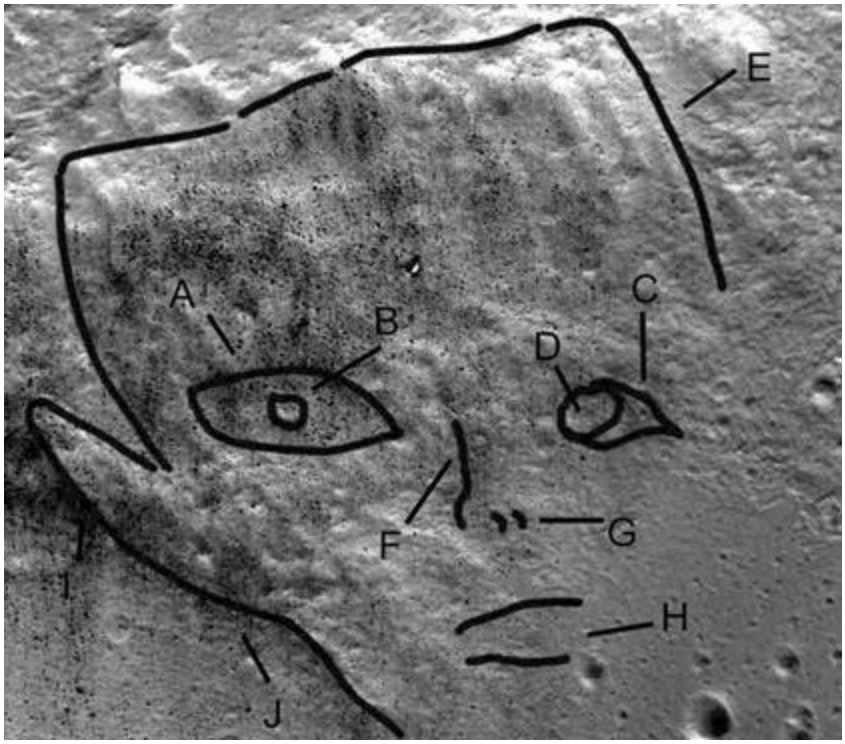

Figure 78. The face outlined with annotations.

Conclusions

The King's Valley was probably next to a paleosea that lasted for close to a billion years. It is in an area considered to be a plausible location for Martian life to have existed. This are would have experienced many cycles of rain and a water table or groundwater connected to the paleosea. There have been suggestions of stromatolite fossils and microbial mats have been observed by the Rovers nearby in Gale Crater [4] according to Bontemps. This could have been food for the five possible species of fish on the King's Valley wall. In turn this can represent a food chain for life that was intelligent enough to build these simple structures before going extinct. It then depends on whether this paleosea existed for long enough and whether Martian life could have evolved quickly enough before the planet cooled. Some chance mutations in a high radiation environment may have caused accelerated evolution to occur. Alternatively, Mars could have been terraformed by visiting aliens of an AI probe as explored in [4]. By creating Tharsis Montes and Elysium Mons this would have caused these paleoseas to form. Much of this is speculation but is based on the geological evidence generally accepted.

The formations over and over portray crowned faces and figures in different poses and expressions rather than other possible shapes. This represents low entropy and low degrees of freedom, each time the similarities repeat they could have been something recognizable yet very different. This is not how pareidolia works, we might see something we recognize as a face but not as the same kind of face over and over. In the author's opinion, there is simply too much evidence in the King's Valley for a natural explanation to be credible.

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Possible alien artefacts in Libya Montes Mars

Greg M. Orme

Keywords: Mars; King's Valley; Xenoarcheology; Crowned Face; Cydonia; Libya Montes; SETI.

Abstract: **In July 2000 the formation known as the Crowned Face was discovered by the author. Many other possible artefacts have been discovered on Mars since the first Viking image of the Cydonia Face in 1976. However this evidence has been difficult to analyze scientifically when relying only on their appearance. The main objection is that we see faces on the Martian surface like we might see faces in clouds, this is known as Pareidolia. The challenge has been to scientifically prove these formations are real. In this paper the evidence is falsified against natural geological processes. Five faces on Mars are directly compared with each other, the hypothesis is that they once represented the same face. Because it is highly unlikely the same facial features could form on Mars five times this enables a statistical argument against chance to be made. A priori predictions are also vindicated, the area was recently reimaged by HiRise. If these formations were naturally formed they would be expected to look less artificial with higher resolution. Instead the number of geological improbable if not impossible parts of these formations has greatly increased, also many new artefacts are now visible.**

Introduction

The Crowned Face was discovered by the author on the 9th July, 2000. The first image containing this formation was M0203051 taken by the Mars Orbital Camera. The subject has remained controversial ever since the discovery of the Cydonia Face by the Viking spacecraft. However more evidence has been accumulating over the ensuing decades. This paper discusses one area in Libya Montes Mars, named the King's Valley by the late astronomer Tom van Flandern. The name refers to a number of face like formations in the valley that have crowns.

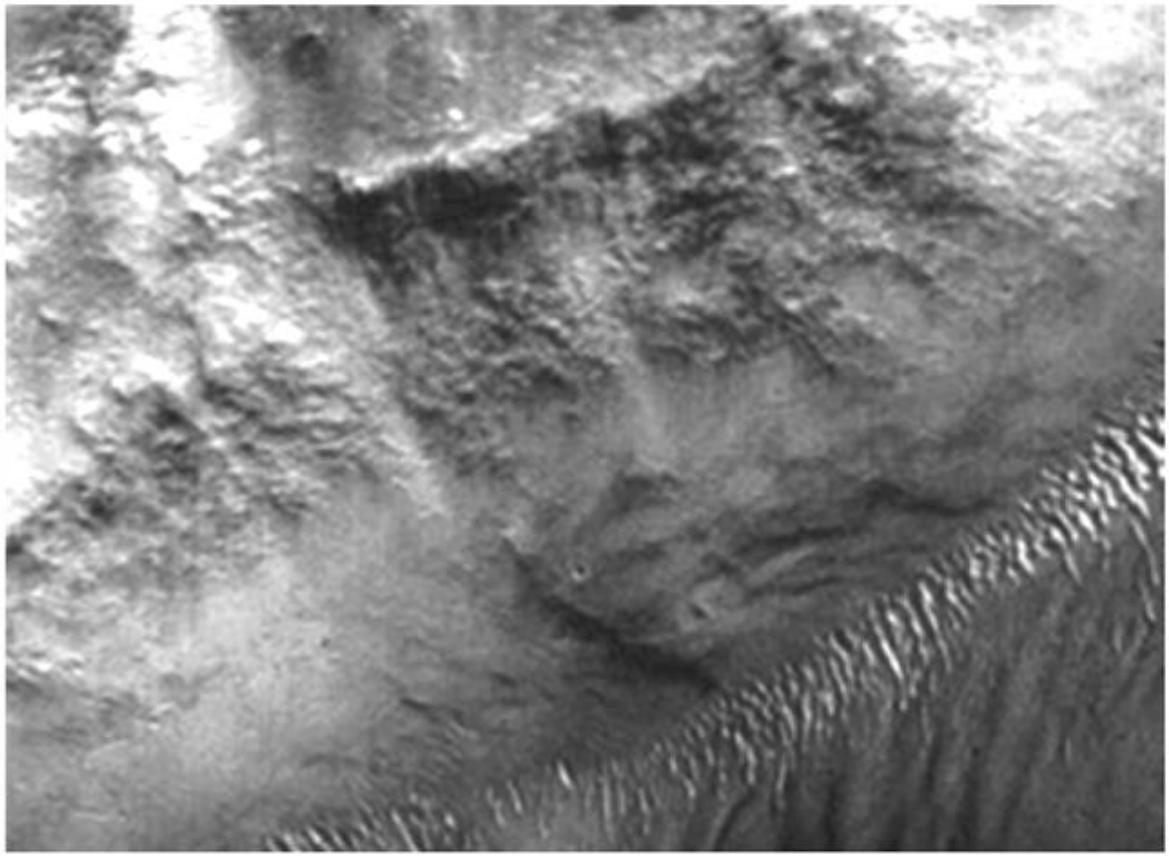

Figure 1. The Crowned Face, Libya Montes, Mars.

Results and Discussion

What is being claimed

This paper claims to have proved artificiality in at least one part of one of these formations in the King's Valley. It is necessary and sufficient to do only this, some areas may turn out to be natural without refuting this proof. However other areas that appear natural may turn out to be artefacts. This is done by two methods, proof by contradiction and proof by reduction to the absurd. The first method demonstrates many aspects of these formations cannot be explained by geological processes. The second method concentrates on the highly improbable resemblance of five Martian faces to each other. The odds against chance come to 10^268 to 1, because this would be impossible to happen randomly the author claims this is a proof of artificiality.

Context of these proofs

While no attempt is made to prove the following statements in this paper, other evidence that has accumulated around these artefacts. It is unfortunately necessary to explain the context of these proofs because of the many exaggerations about this subject. The most important is they are almost certainly extremely old, there is ample evidence of eroded features and movements of faults in and around them. They are likely to range from the hundreds of millions to several billion years of age. For example evidence of association with running water may go back to when Mars had an ocean.

They then have no relationship to UFOs and Von Daniken like theories of aliens visiting human civilizations. Future papers will discuss this evidence. It is mentioned then to emphasize this is a mainstream not a fringe subject. It is about archeological ruins that predate intelligent if not all life on Earth. This evidence then is simply presented as an archeological find. Because of this the paper calls for an expedition to the King's Valley to examine these ruins. More evidence is explained about this in the author's book "Why we must go to Mars: The King's Valley"[1].

A final point needs to be made. The subject of Martian artefacts has come to be seen as a threat to mainstream science. Perhaps this has been because of the exaggeration of flimsy evidence in the media, this has led to many scientists being fearful to be associated with the artificiality hypothesis. However nothing should be further from the truth. This paper makes the claim that Martian artefacts will irresistibly draw us to explore them and other parts of Mars. This will result in a massive funding boost for space exploration. Scientists will not have their careers threatened by this, but enriched.

These artefacts may literally be the keys to the solar system for humanity, after decades of being stuck in low Earth orbit. For example no one knows why faces would be created like this, their being faces makes it seem more likely to be Pareidolia where people naturally see faces in random patterns. However there are mainstream explanations. For example life in our solar system may have been deliberately seeded by whoever created these faces. In effect then the interesting question is why we look like them, not why they look like us. If, and this is only speculation, we are a former colony then it is something we need to find out about.

Proof One: Reduction to the absurd

Pareidolia, as mentioned earlier, is where people see faces and familiar objects in clouds, rocks, toast, etc. However they don't see the same faces over and over. Faces are a very loose definition, we apply this to billions of humans, some animals, cartoon characters, artistic works, etc. With such a wide definition, the argument is that some faces would appear on Mars by random chance. And this argument is surely correct, the fringe media has shown many claimed artefacts that could not stand up even to cursory scrutiny.

However with people and with faces in clouds we don't see the same faces over and over. When we meet two people that have too close a resemblance, we suspect some family connection with them. Clouds are formed by randomly moving molecules of water vapor, it becomes increasingly unlikely faces similar to each other should appear in them.

To refute the Pareidolia hypothesis then we need Martian faces to be similar enough to each other. The more similar then the less likely random processes such as wind and water could have created them. It would imply a common process, like craters on Mars resemble each other because they are formed in similar ways. Fortunately this is the case, there are five main faces on Mars analyzed here.

This proof claims they originally represented either the same face or ones sufficiently similar to each other. There are so many similarities the odds of chance reach the point of reduction to the absurd, that there must be a common process forming them. Since there are no geological processes known to preferentially form the same face over and over this only leaves artificiality as an explanation.

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[1] Available for download at **http://www.xenoarcheology.org**

Comparisons of Face One and Face Two, the Crowned Face

22 points of similarity are shown in the author's book between these two faces, because of the limited space available only some are shown here[2]. Figure 2 shows the position of Face One to the left of Face Two, the main Crowned Face. It is highly eroded but becomes apparent in an overlay of Face Two onto it. Figure 3 shows an outline of this face. The faces are numbered and so in the rest of this paper the Crowned Face is referred to as Face Two.

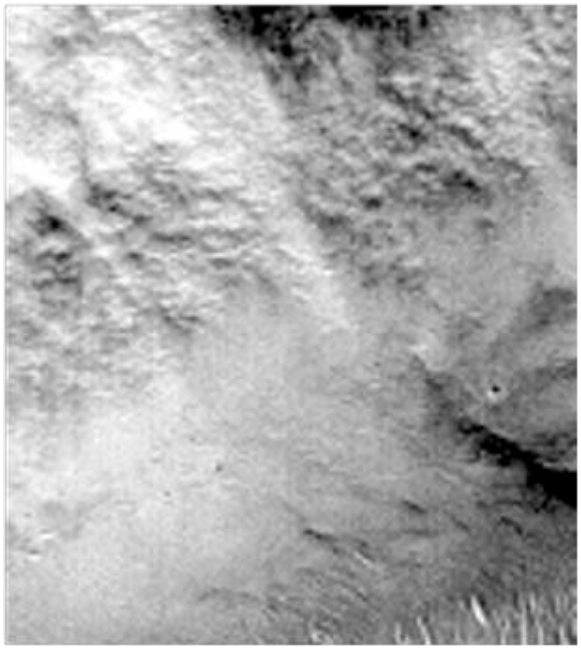

Figure 2. Face One.

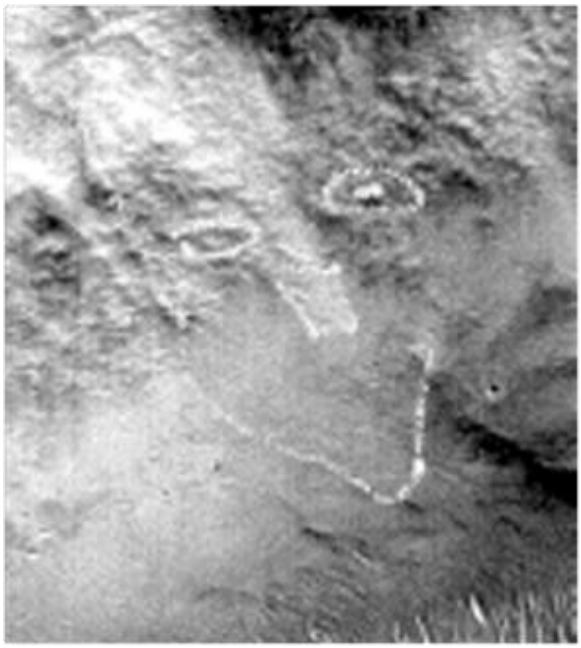

Figure 3. Face 1 outlined.

The faces were compared by overlaying them on top of each other and then morphing between them. These were made into videos shown in the presentation[3], copies can be downloaded at the website. When a facial feature was judged to be very similar it was included in a list of these similarities. It is unlikely that two randomly selected features on Mars should overlay with many similarities.

Some exceptions have obvious reasons for this, for example craters, mesas, rivers, etc. Because this is unlikely each similarity is assessed at 10 to 1 against chance. Later this will be lowered to an absurd 11 to 10 against chance to show the overall odds are still impossible to explain by chance. The real odds may be 1,000 to 1 or much higher for each of these similarities.

[2] The book shows these, download at **http://www.xenoarcheology.org**

[3] These videos can be downloaded at **http://www.xenoarcheology.org**

Face One overlaid on Face Two

In Figures 4 and 5 Face One is overlaid onto Face Two with different levels of transparency. In an art program one face is placed over the other. Then the top image is progressively made more transparent to show the image underneath. The result is a morphing from one face to another.

This also has the advantage that the similarities are obvious from the videos, anyone can use these to select their own similarities and compile their own odds against chance. There will always be some disagreement about individual similarities, however many were left out or underreported. For example an eye shape may be similar in many ways but was only included as one similarity. The jawline matches closely along its entire length and was also only counted as one. Just these two features could then add 5 similarities more than claimed in the overall odds against chance.

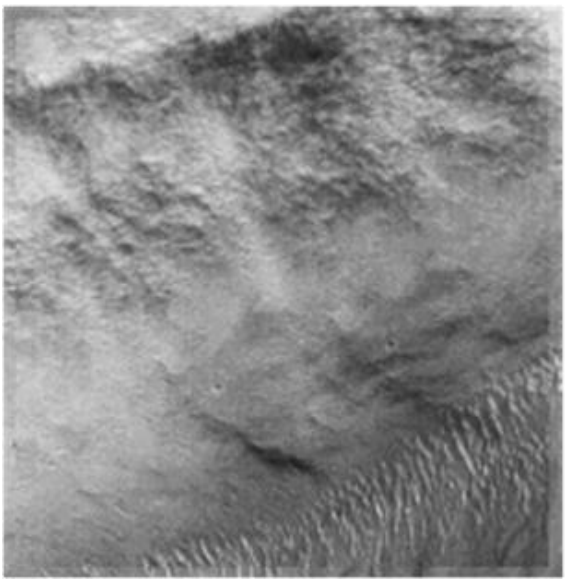

Figure 4. Face 1 overlaid on face 2 with a first transparency level.

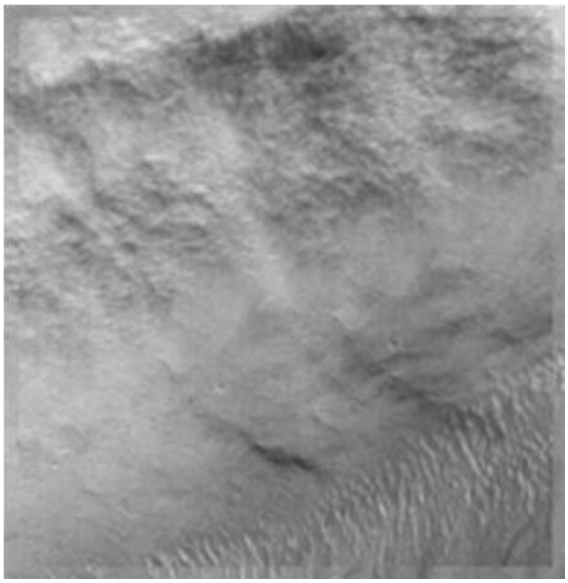

Figure 5. With a second transparency level.

Similar chins

As the overlays are evaluated similarities are then added up, between Face One and Face Two there are conservatively 22 similarities. When features fail to match up they tend to confuse the image, for example if the eyes did not line up then the overlay would appear to have four eyes. However here the eyes line up very closely, not just in position but with the details inside them. The overlay shows what Face One would probably have looked like before erosion. Even this overlay is difficult to explain by chance.

Next the chins are compared. In figure 6 the line at A at first appears to be a defect and hence evidence for it being natural. However it is also part of the jawline for Face Three shown later, this is A in figure 7. Apparently, for symmetry this same line appears on Face One. It is less clear there because much of Face One is buried to some degree under soil. Both have the same left jawline orientation. This is assessed at 10^3 to 1 against chance because there are 3 features here.

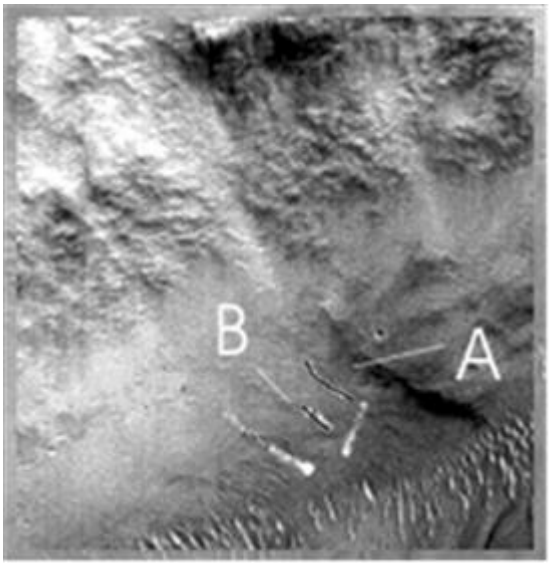

Figure 6. Face 1 chin and 2 lines.

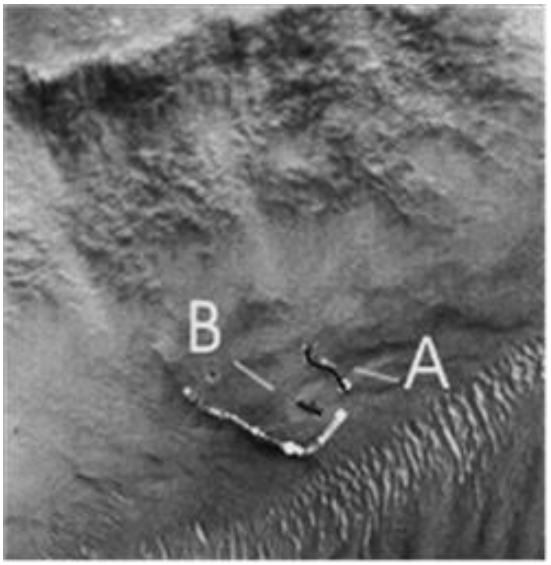

Figure 7. Face 2, the same lines and chin shape.

Similar crowns

In figures 8 and 9 the left edge of the crowns are compared, these are seen in the overlays in figures 4 and 5. The shape is very similar, this is also assessed at 10 to 1 against chance. Because of space reasons the other similarities cannot be shown here, but they are in my book.

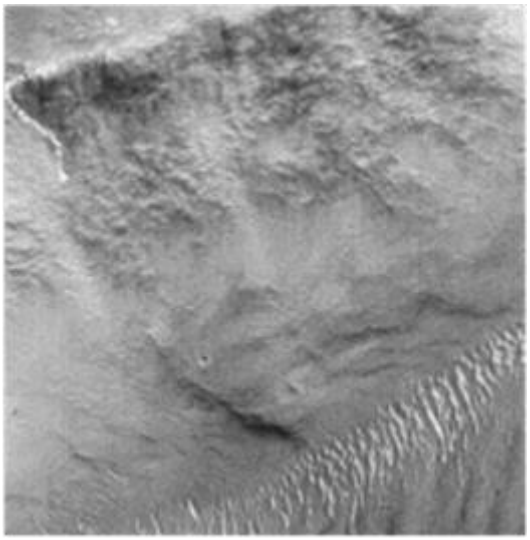

Figure 8. Left edge of face 2.

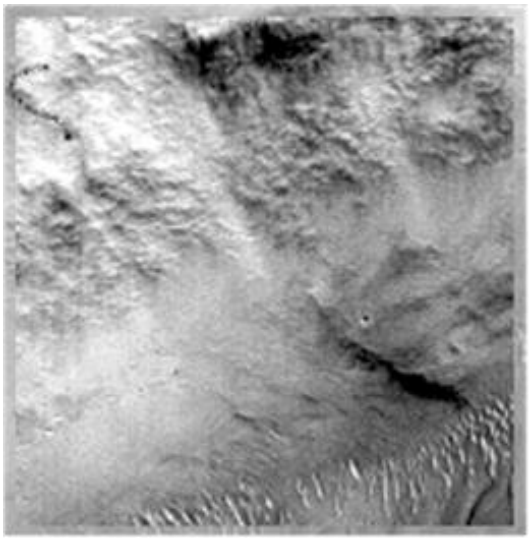

Figure 9. Left edge of Face 1.

A comparison of Face Two and Face Three

On the right of Face Two, the main Crowned Face, there is another highly similar face called Face Three. Each face then tends to overlap onto the next one, in some cases sharing features. For example earlier in figures 6 and 7 the left jaw of Face Three appeared as a line on Face One and Face Two.

This design may seem confusing but it gives a powerful way to prove artificiality as claimed because of these similarities. Figure 10 shows Face Three, figure 11 shows it outlined. Similarities with Face One and Two may already seem apparent. These two faces were overlaid as with Face One and Two, the similarities were then listed and assessed at 10 to 1 each.

As before this was made into a small movie shown in the presentation and available for download at the website. With 37 similarities this gives an odds against chance of 10^37 to 1 against chance. With 22 points of similarity between Faces One and Three this gives a total of 10^59 to 1 against chance.

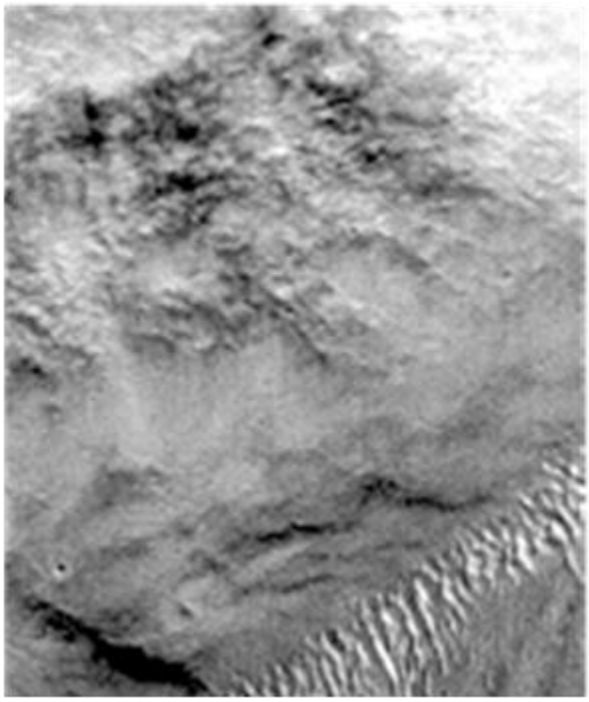

Figure 10. Face 3.

Figure 11. Face 3 outlined.

In figures 12 and 13 two frames from the movie morphing Face Two and Three are shown. As before where features line up they are much darker and more distinct, the left eye from the two faces for example lines up in its interior details. The two noses line up as do the mouths. The right eye of Face Three may be missing where a large piece of rock has fallen from the slope.

Alternatively the eye may be a smaller oval shown in the next section which also overlays with an oval on Face Two. While some of these features may seem less face like this is irrelevant for the claimed proof. It only relies on the similarities between these features, what those similarities are is not important as long as they don't resemble natural features like craters, etc. One possible explanation for multiple eye shapes is they might have been highlighted sequentially as the sun moved. This would make the face appear to move its eyes.

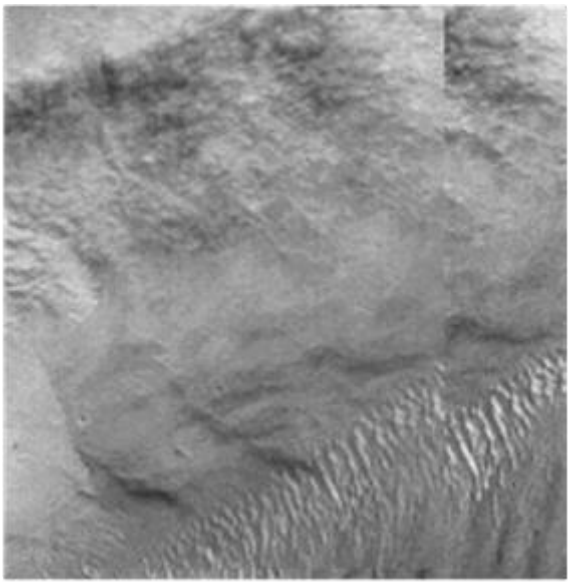

Figure 12. Face 3 overlaid on Face 2 at one transparency level.

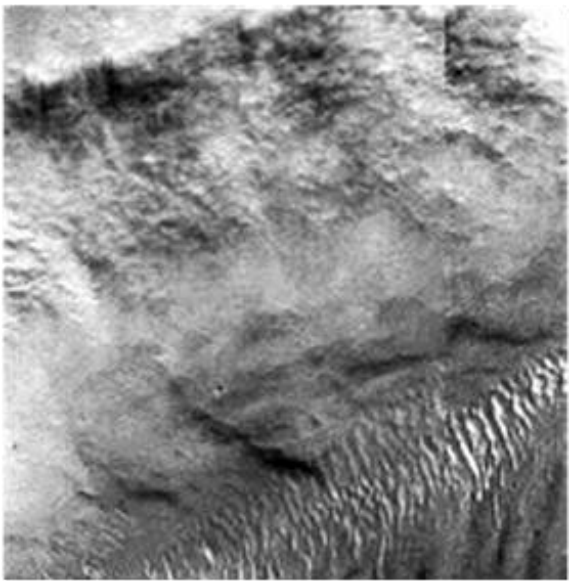

Figure 13. A second transparency level.

Similar eyes

As will be seen later the HiRise image of this area shows an eye shape in this right hand oval in figure 15. There are these two eye shapes shown in figure 14, then the same two shapes in figure 15. Face Two's eye is removed there to see Face Three more easily. They also appear in Face One. Each is assessed at 10 to 1 against chance.

Figure 14. Eye and oval shape on Face 2.

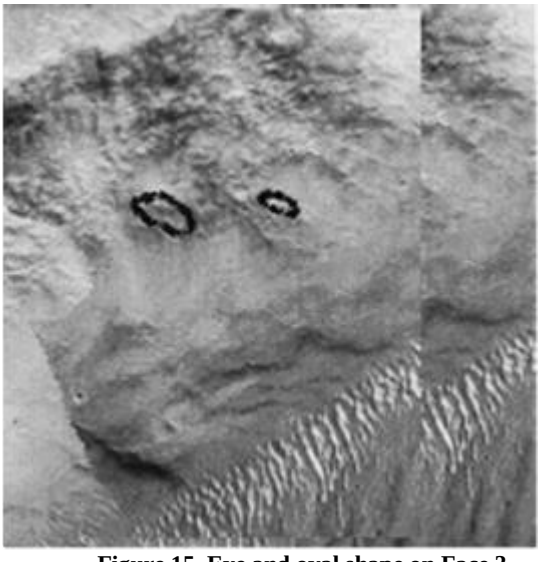

Figure 15. Eye and oval shape on Face 3.

Similar jaw line and side of head

In figures 16 and 17 the jawline and the left side of the head of Face Two is replicated in Face Three. This is assessed at only 10 to 1 against chance. The jawline of Face Three was mentioned earlier, the side of Face Three's head is shown as a line on Face Two in figure 17.

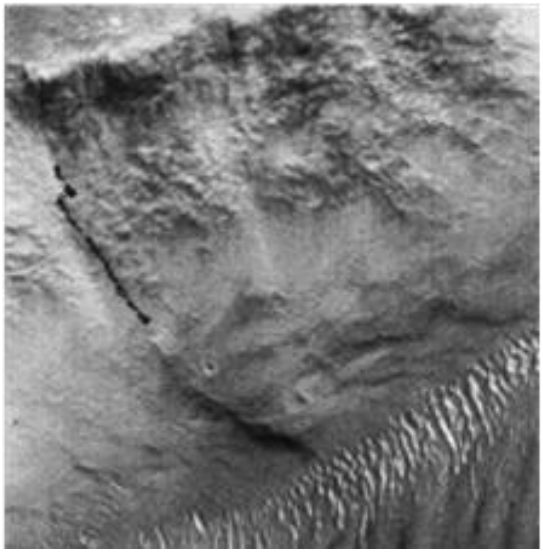

Figure 16. Left side of the head of Face 2.

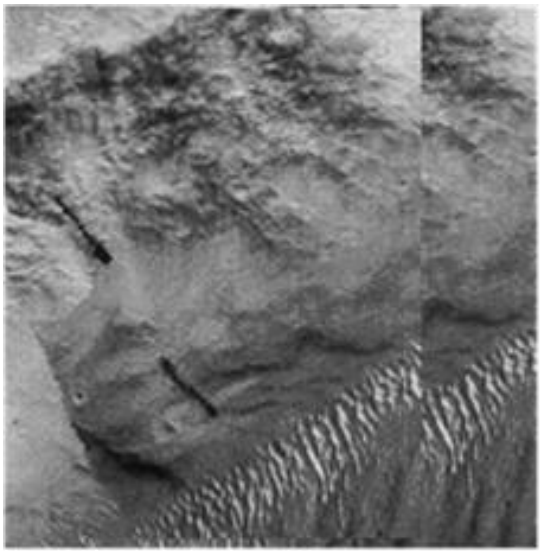

Figure 17. Left side and jawline of Face 3.

A nose like shape and the Face Two nose

As was explained this proof is not based on how face like these formations are, that would always run into the objection of Pareidolia. Instead it uses the similarities between these three faces and a further two faces to show they should not be so similar. It is not then a defect in this claimed proof for some aspects to be less face like. For example in Figure 17 the dark line marking the left side of the head and left side of the jaw is interrupted by the nose tip of Face Two.

Symmetry would imply there be a similar shape on the left side of Face Two but Face One is shifted a little too far to the left for this. In figure 18 a nose like shape appears at A to complete the symmetry of figures 16 and 17. As seen in figure 19 this shape is confirmed by HiRise. It is assessed as 10 to 1 against chance.

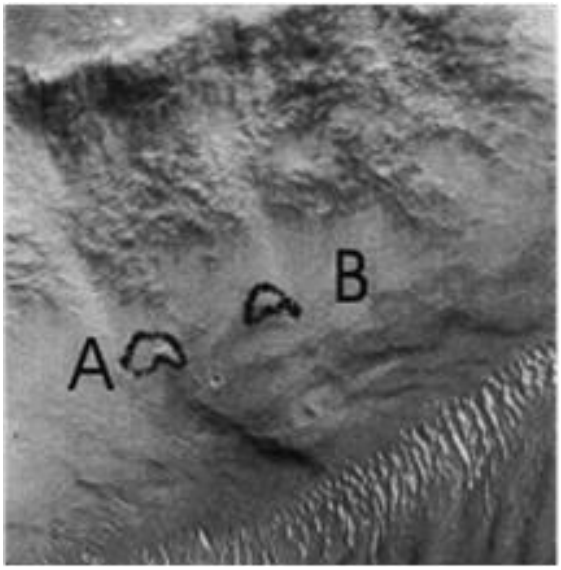

Figure 18. A nose like shape.

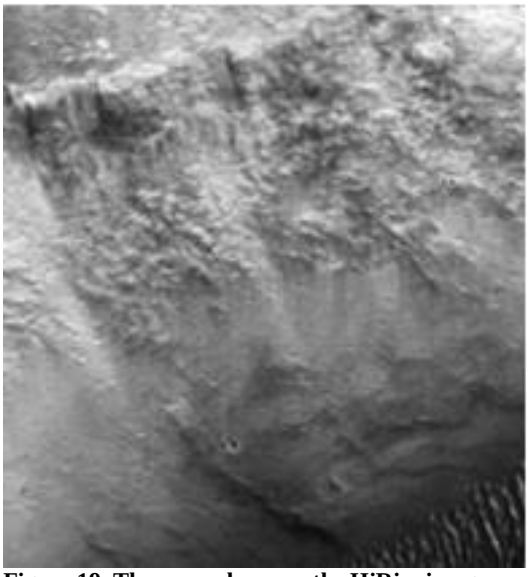

Figure 19. The same shape on the HiRise image.

Three similar right eyes

Figure 20 shows the three faces. .Face One has a right eye shape shown in white, this is the left hand oval in figure 21. Face Two has a similar eye shape shown in white as the middle oval shape. Face Three has a similar shape, this is shown as part of an oval on the right perhaps because this piece of the slope fell off. This is assessed at 10^2 or 100 to 1 against chance.

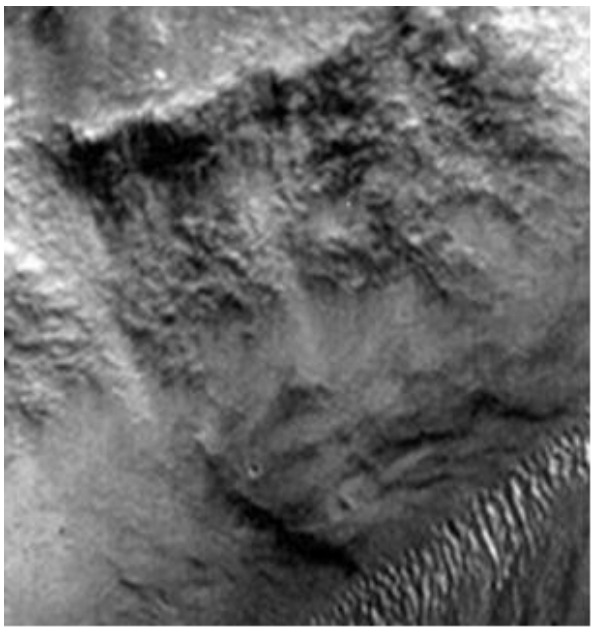

Figure 20. Face 1,2, and 3.

Figure 21. Three similar eye shapes.

Similar noses

In figure 22 the noses of Face Two and Three are shown as B and C. The nose tips are similar in shape, asymmetric so the left nostril is bigger than the right. The Face Three nose tip is clearer at A in figure 23 from the Mars Orbital Camera image M0303483. However in figure 24 the nose tip from Face One is missing, this allows us to make an a priori prediction that this will be seen in the HiRise reimaging. If it is not there, or there is no reason for it missing, then this would undermine the symmetry and claimed proof. However as will be seen this prediction is confirmed.

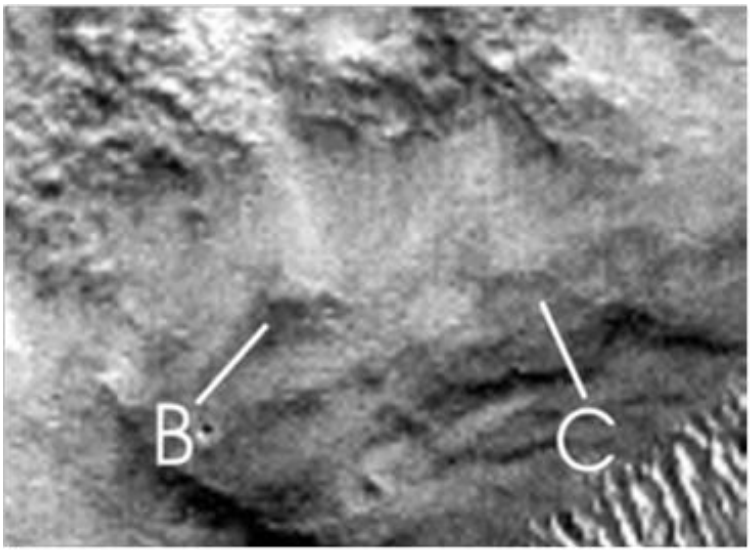

Figure 22. Face 2 and 3 noses.

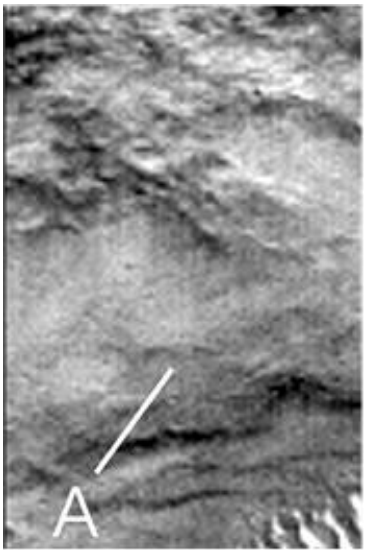

Figure 23. Face 3 nose tip.

Figure 24. Missing nose tip of Face One.

Three pairs of alternate eyes or other shapes

While the alternate right eye shape of Face Three was shown in figure 15 it can also go with a left eye shape as shown in figure 26. This may then allow the eyes to look in different directions with different sun angles. However as has been emphasized the claimed proof of artificiality does not need these features to be face like, only to be similar. The same shape appears on Face Two in figure 25 and on Face One in figure 27. Each is assessed at 10 to 1 against chance.

Figure 25. Alternate left eye shape on Face 2.

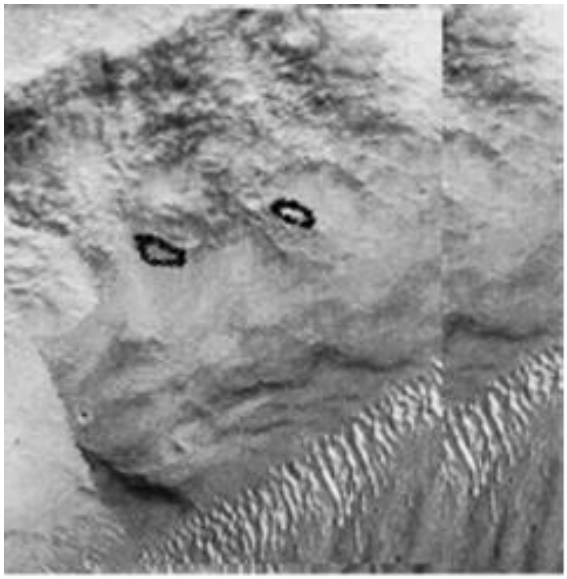

Figure 26. Alternate left eye shape on Face 3.

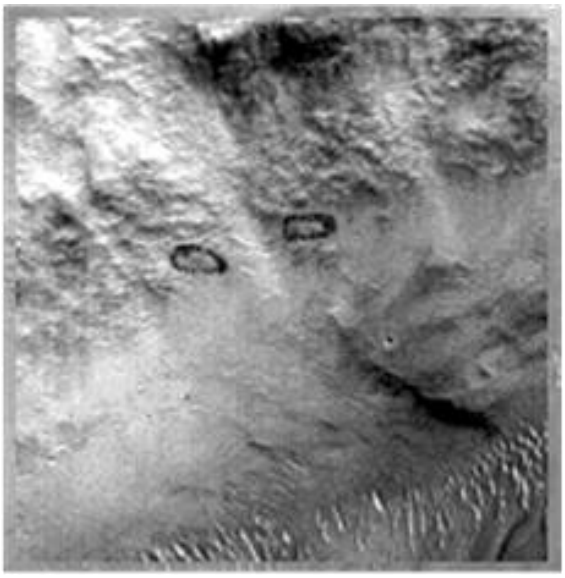

Figure 27. Alternate left eye shape on Face 1.

Three similar marks

In figures 28, 29, and 30 there are similar marks on each face. Each is assessed at 10 to 1 against it appearing in the same place on the other faces. There are many other marks like this, which could also be counted, but these have been left out. An argument could be made there are twice as many similar points on the three faces as have been used in this proof. Some similarities then might be debated about or removed, but many more could be added.

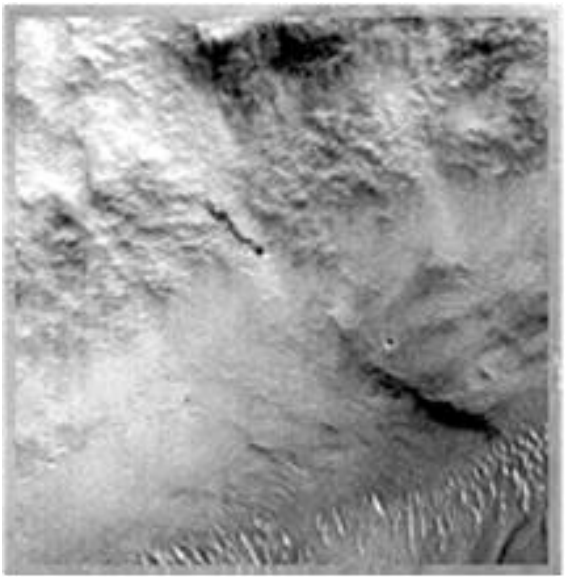

Figure 28. Mark on Face 1.

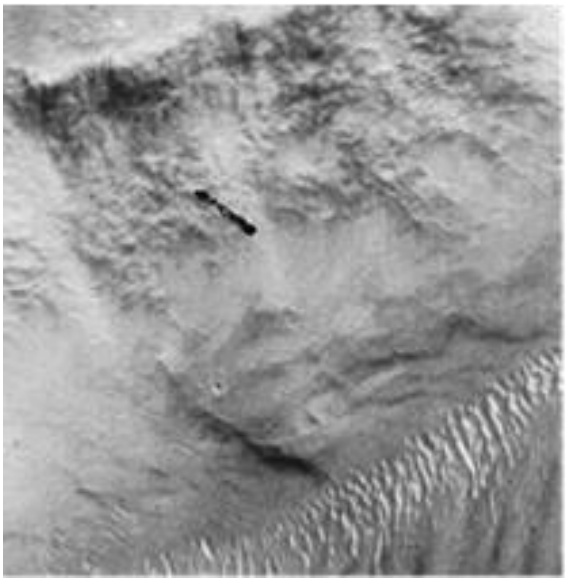

Figure 29. The same mark on Face 2.

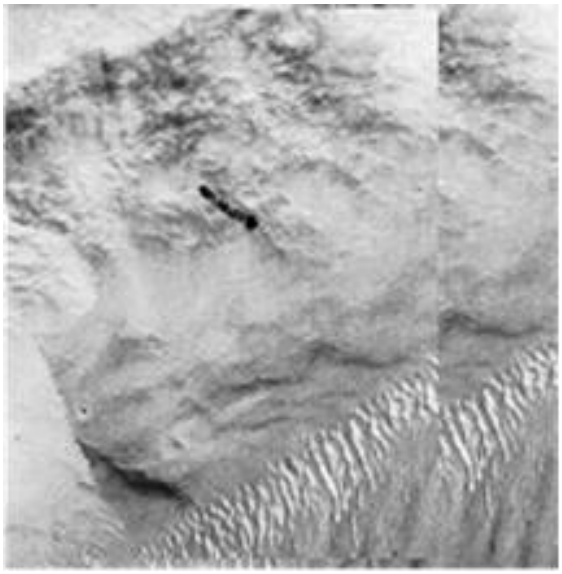

Figure 30. The same mark on Face 3.

Smiling at us or frowning? You decide

The mouths are similar as shown in figures 31 and 32. This is assessed at 10 to 1 against chance. They seem to have slightly different expression that may indicate the three faces were meant to show a different emotional expression.

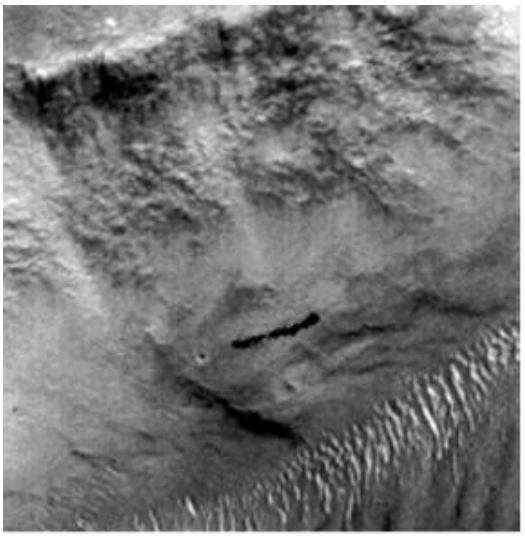

Figure 31. The mouth of Face 2.

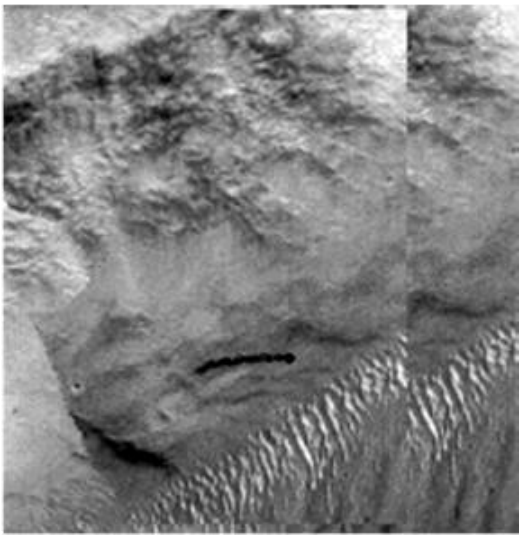

Figure 32. The mouth of Face 3.

Controls

For well over a decade amateur researchers have scoured Martian images looking for signs of artificiality. However the successes have been very scarce. Figures 33, 34, and 35 suggest that erosion may be a reason for this. Figure 33 is another two possible faces but the features were either never there or were worn away by erosion. If these artefacts are over a billion years old this is not surprising, only a few rare formations may have survived.

In figure 34 the HiRise image shows a smooth cliff face opposite the Crowned Face. In all the valleys in Libya Montes the author has only found smooth or highly amorphous slopes. Figure 35 is from near the King's Valley. Generally if there is enough erosion to carve out a valley there should be enough to make the sides of it smooth. However the HiRise images of the three Crowned Faces show remarkable details next to highly eroded slopes.

Why then should random eyes and noses form in this valley and nowhere else? How would they survive erosion when the slope right next to them is worn smooth? For these faces to be random variations of geological processes there should be other slopes with similar but non-face like features. Figure 35 is the most plausible natural feature found but even it has no hollows in it that could form like eyes and nostrils.

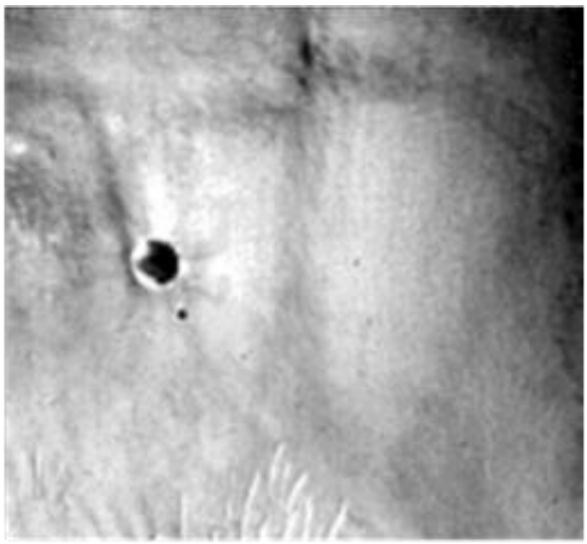

Figure 33. In the King's Valley opposite the Crowned Face, MOC image.

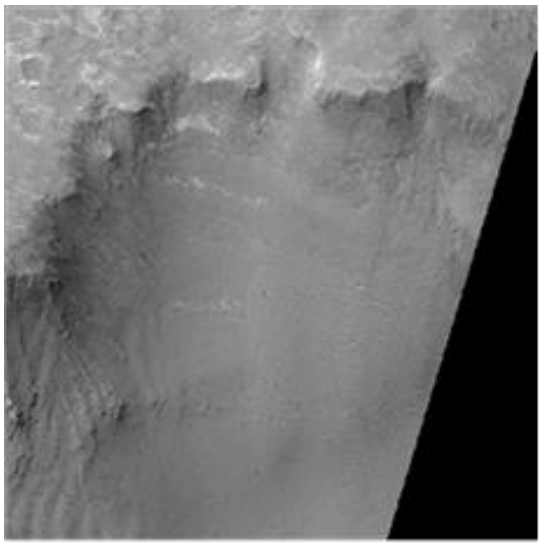

Figure 34. HiRise image opposite the Crowned Face.

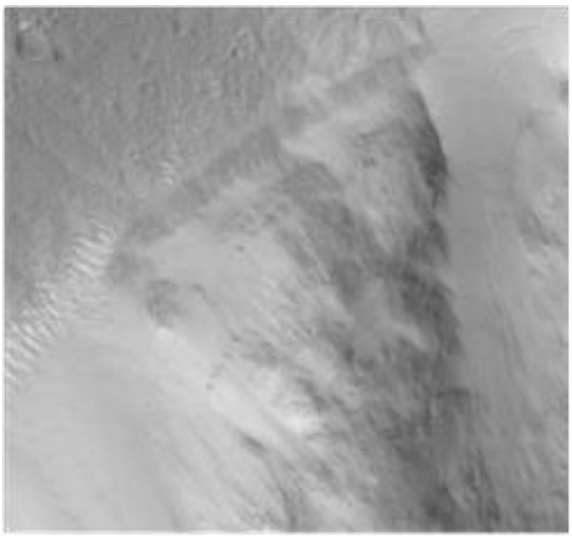

Figure 35. A nearby valley in HiRise image ESP_012289_1840.

Comparing the three Crowned Faces, the Meridiani Face, and the Cydonia Face.

So far there are 81 similarities in the three faces, and arguably many more. There are 22 similarities between Faces One and Two, 37 between Faces Two and Three, and 22 between Faces One and Three. These are assessed at 10^81 against chance which alone should be proof for artificiality. However there are two other faces to compare to them, the Cydonia Face and the Meridiani Face. These also have many similarities implying they were all originally the same face or very similar to each other.

Comparing the Cydonia Face compared to the Meridiani Face

There are 37 points of similarity between these two Faces, more details are shown in my book. Space here doesn't allow for them to be shown, however many should be apparent in the overlay. This gives an odds against chance of 10^37 to 1and a cumulative total of 10^118 to 1. Figure 36 shows the Meridiani Face, Figure 37 the Cydonia Face, and Figure 38 is an overlay of the two faces.

Figure 36. The Meridiani Face.

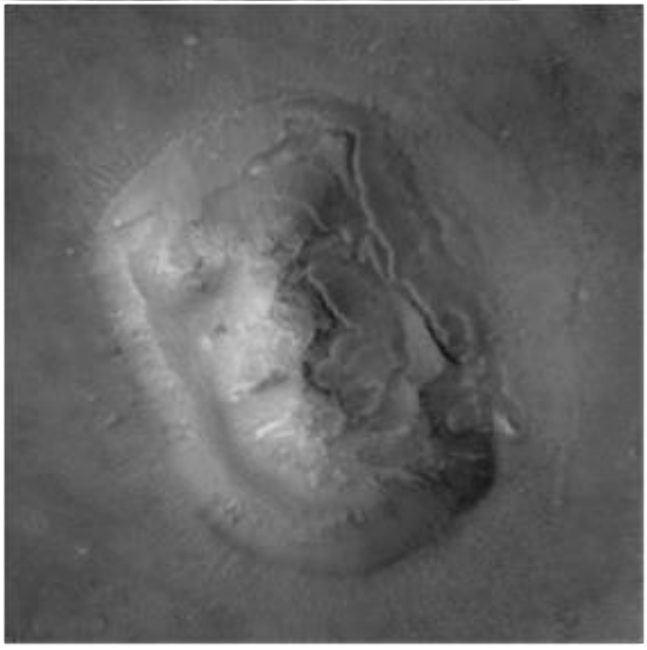

Figure 37. The Cydonia Face.

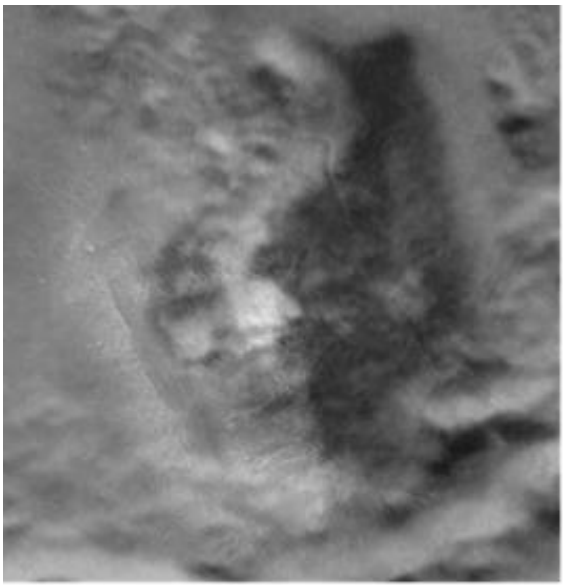

Figure 38. The overlay of the Meridiani and Cydonia Faces.

The Cydonia Face compared to the Crowned Face

There are at least 14 similarities between the two Faces, shown in the book. This gives an odds against chance of 10^42 to 1 with three Crowned Faces and a cumulative total of 10^160 to 1 against chance. The overlay is shown in figure 39.

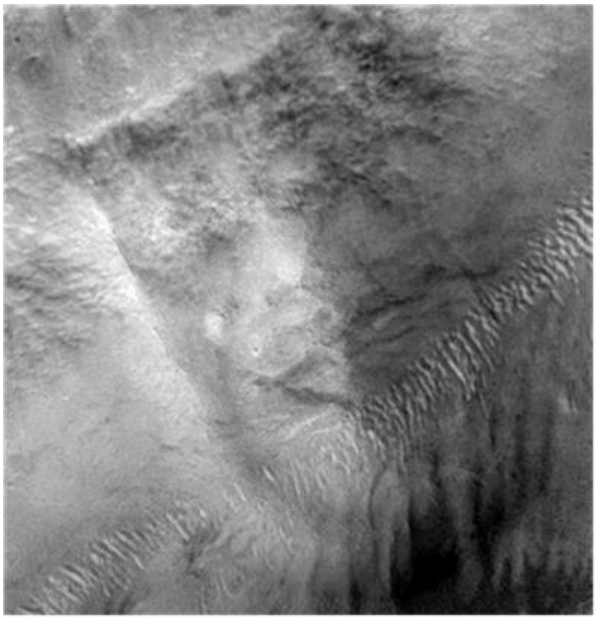

Figure 39. An overlay of Face 2 and the Cydonia Face.

Comparing the Crowned Face and the Meridiani Face

There are 36 points of similarity with the Crowned Face, because of space consideration in this paper these can only be seen in the book. This gives 10^36 to 1 against chance, with three Crowned Faces this gives 10^108 to 1. The cumulative total now comes to 10^268 to 1 against chance.

How to interpret 10^268 to 1 against chance?

There are only about 10^80 atoms in the universe by comparison, how could these odds be so high and still be just a coincidence? There are several ways to object to this conclusion. The first is to question some of the similarities. However as mentioned earlier the overlays show very few signs of misaligned features. Another way is to question 10 to 1 as too high.

However it might arguably be too low, these faces could easily have been quite different and still plausibly artificial. Taking 5 random people we might find the chances of their faces overlaying this well to be less likely, but people are created by nonrandom process. But if 10 to 1 is too high then what about 11 to 10? This should be absurdly low even on a Mars covered in faces or even in a single family. Even so 1.1^268 is still 123,948,028,235 to 1 against chance.11 to 10 then reduces to the absurd again and still gives over 100 billion to 1 against chance.

Even a Mars covered in random faces could not be as low as 1.1 to 1 for each similarity. Another way might be to question whether these similarities are really independent and hence the odds should not be multiplied together. But no one has ever suggested a geological process that consistently makes eyes with irises and noses with nostrils. Also the three Crowned Faces are in a valley, the Meridiani Face is in a crater, and the Cydonia Face is on a mesa. All of these are formed differently geologically.

Still another way is to suggest that random areas of Mars are naturally similar to each other like this. First however similarities with known processes such as craters, dunes, mesas, etc must be excluded. Even these however could not usually overlay with less than a 10 to 1 against chance for each similarity, they have a wide variety of shapes. But assume any two amorphous areas of similar size had on the average 5 similarities by random chance. With 10 pairs of these subtract 10^50 from 10^268 to 1.

This still leaves 10^218 to 1 or 1.1^218=1,055,857,634 to 1. Ten similarities in pairs of areas by random chance would be absurd, Mars would again be covered in faces. But this still gives 10^168 to 1 or 1.1^168 is 9 million to 1. 10^268 to 1 reduces the natural hypothesis to absurdity. Trying to reduce this figure in other ways also leads to absurdities. Hence the claim that artificiality is proven.

Refuting the geological explanations

HiRise has reimaged part of the King's Valley with two images, numbers ESP_018368_1830 and ESP_018223_1830. However we still need higher resolution images, the JP2 image is only 500 megabytes. The implicit a priori prediction was that higher resolution images would show more face like features and more similarities between the faces. This has been successful in each part of the faces. This prediction was also falsified by other possible faces in the King's Valley. They appeared much less artificial at higher resolution. These are shown in the book. This then is a prediction that was proven correct in some cases but other predictions failed.

Face One reimaged by HiRise

All the face like parts of Face One are more face like in the HiRise image. Also an important prediction mentioned earlier was confirmed. In the MOC images the nose tip of Face One is missing, if it is artificially constructed then the builders would have included one. So in the HiRise image there should either be a nose tip or a clear reason why it is missing. This prediction is confirmed in the images below.
Figure 40 shows the HiRise image of Face One, figure 41 shows an outline of it. In figure 42 at D there is a wavy line like a break, it casts a shadow indicating the top is higher than the bottom of this line. This is at the right place for the nose to have broken off, there are also three craters right here which may have caused it to break off.

F shows the shape of a nose tip similar to those of Face Two and Three. This is very difficult to account for by random chance. E shows an eye shape with a convex area for the iris as does A. B shows similar eyelid shapes to the right eye of Face Two as will be seen. It also shows a round iris shape with a dark pupil. All of these represent additional a priori predictions that with new HiRise images they will appear more face like.

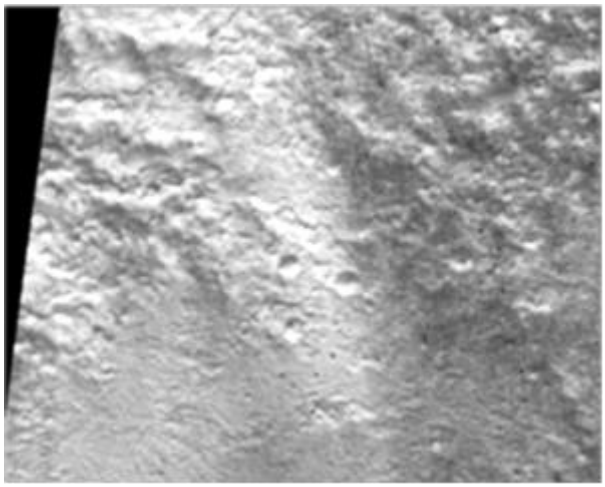

Figure 40. Part of Face 1.

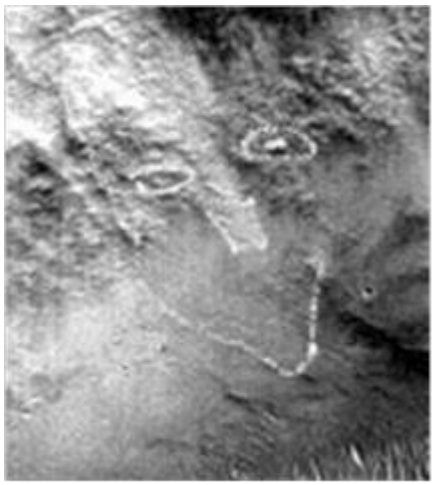

Figure 41 Outline of Face 1.

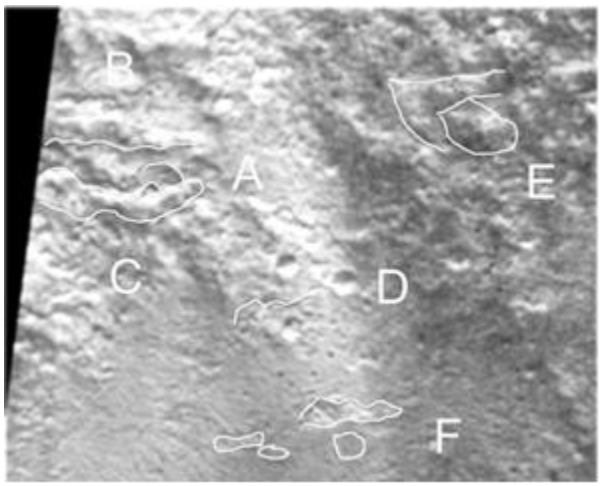

Figure 42. Outlines of predicted features.

Face Two, the main Crowned Face from the MOC on the left, from HiRise on the right

The HiRise image shows more details than from the MOC, nothing appears less face like. Figure 43 is the MOC image and 44 is the HiRise image. The eyes are more clear showing distinct irises and pupils formed by shadows. The nose shows cavities where the nostrils would be.

If these features are random then a higher resolution should be equally likely to make each one more or less face like. Consider any 20 features out of the 66 similar ones. Then 2^20 is over a million to 1 as all of these became more face like and not less face like. This is like tossing a coin 20 times and it comes up heads each time. Up to 35 features improved would be, at 2^35=34,000,000,000 to 1 against chance. Score each improvement at 4/5 or better, this gives 5^35=2,910,383,045,673,370,361,328,125 to 1.

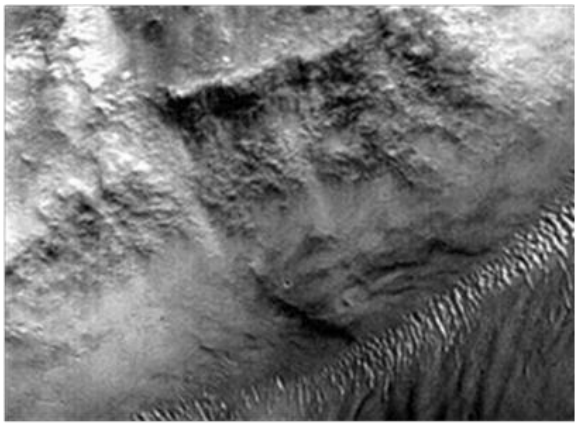

Figure 43. MOC image.

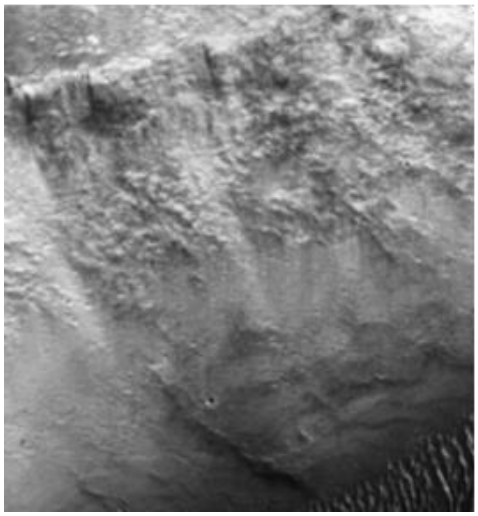

Figure 44. HiRise image.

Main Crowned Face (Face Two) right eye

Figure 45 is the right eye of Face Two, figure 46 is annotated. A, B and D show similar folds around the eye to that of Face One. Along with C these should not form naturally on a cliff face smooth elsewhere. E shows a rounded iris perhaps designed to stand out with shadows.

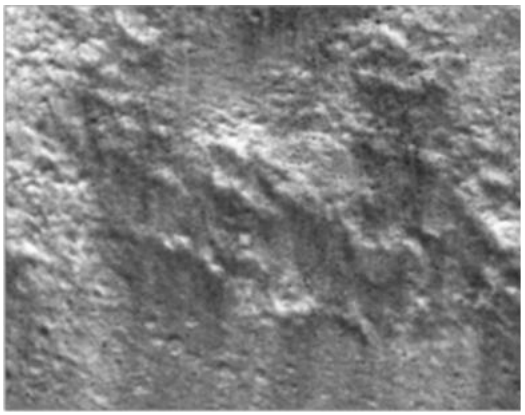

Figure 45. Right eye of Face 2.

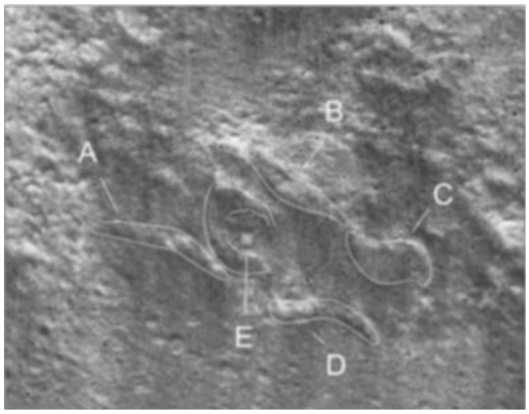

Figure 46. Right eye with annotations.

Face TWO left eye

A left eye is shown from each HiRise image, higher resolution images with a better sun angle are needed. Figures 47 and 48 are the left Crowned Face eye from separate HiRise images while figure 49 is an outline of the eye. It appears to have been carved into the rock.

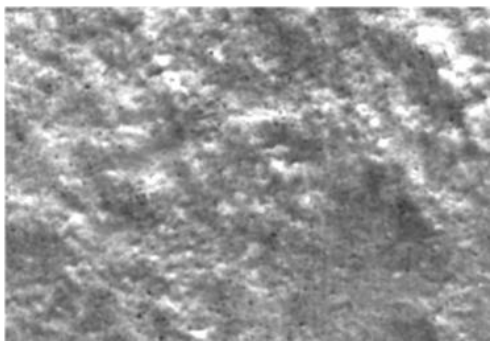

Figure 47. Left eye Face 2.

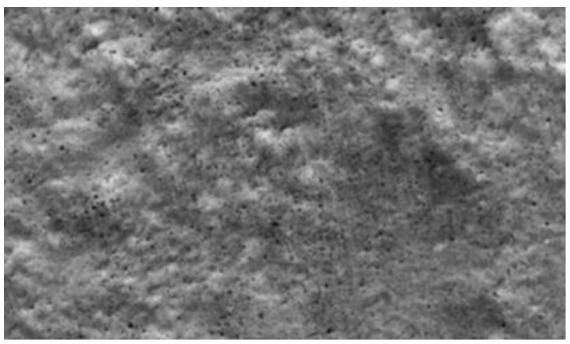

Figure 48. Left eye, from the 2nd HiRise image.

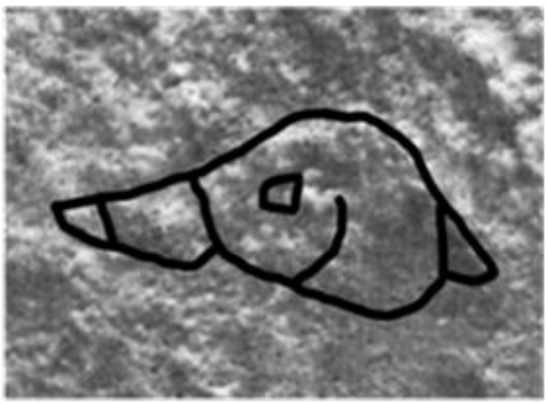

Figure 49. Outline of eye.

Close up of Crowned Face nose

Figure 50 shows the Face Two nose from HiRise, figure 51 is annotated. A shows a lighter area where the bridge of the nose is, the shading shows it standing out. B shows a nose tip shape like the eroded one on Face One. It is also like the nose tip on Face Three. C shows the edges of the right nostril that may define its shape with shadows

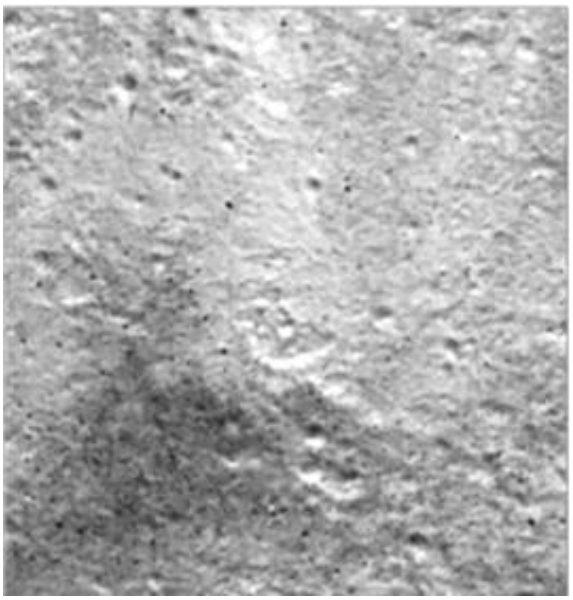

Figure 50. Face 2 nose.

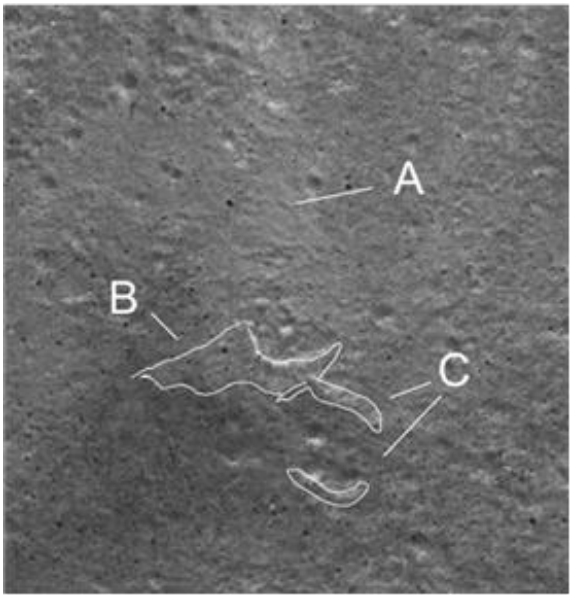

Figure 51. Nose with annotations.

Face Three right eye, the iris is not a crater

Figure 52 shows the alternate right eye of Face Three, to its upper right is the large cavity that may also act as an eye. There is a convex rounded iris here and an upper eyelid shown outlined in figure 53 Figure 54 shows the right black oval as the position for this eye shape.

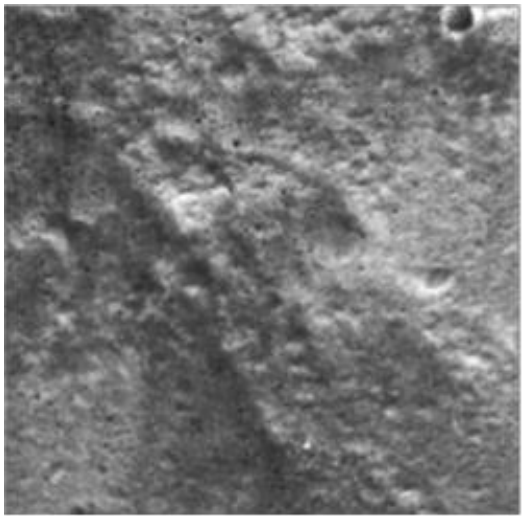

Figure 52. HiRise image of Face 3 right eye.

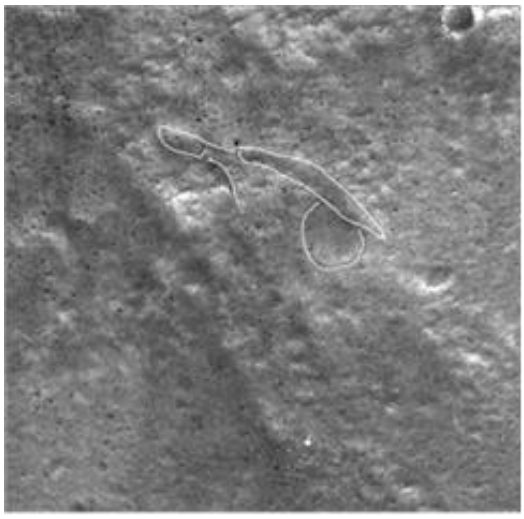

Figure 53. Right eye with outlines.

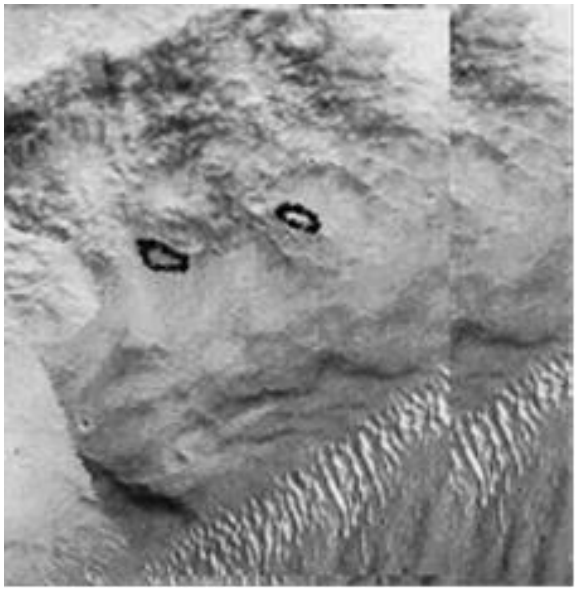

Figure 54. Right eye on Face 3.

Face Five, the profile Crowned face looking to the right, has the same shape and crown, four similar faces in a row

Figure 55 shows the profile Crowned Face, Face Five, reimaged with HiRise. Figure 56 shows this annotated, A is where the right eye of Face three would be. This might also be the ear of Face Five. The eye shape at K is much clearer, the oval shape carved into the rock should be impossible to occur geologically. It has an iris and a dark pupil.

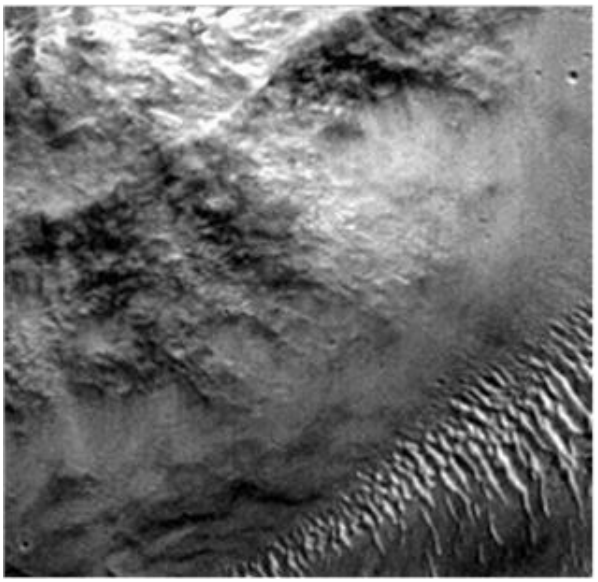

Figure 55. Face five the profile Crowned Face.

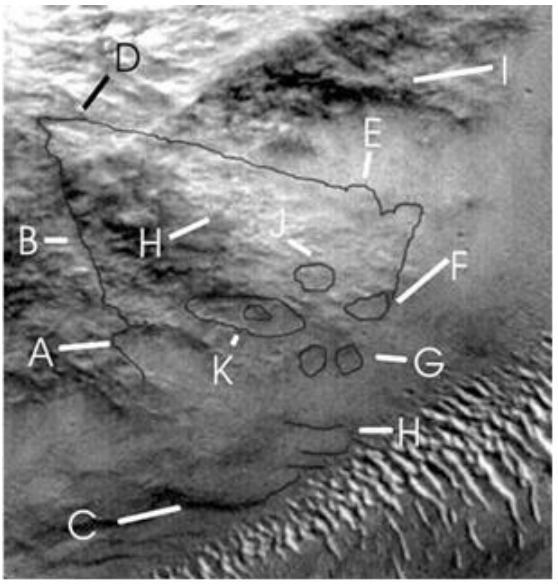

Figure 56. Face five annotated.

A crown shape carved into the rock.

Figure 57 shows Face Five from HiRise, figure 58 is annotated. The eye shape at D is much clearer and a nose shape appears at G, this was not in the MOC image and represents a successful a priori prediction. A shows the apex of the crown which extends past the ridge. B shows this area bulges outwards because it catches the light.

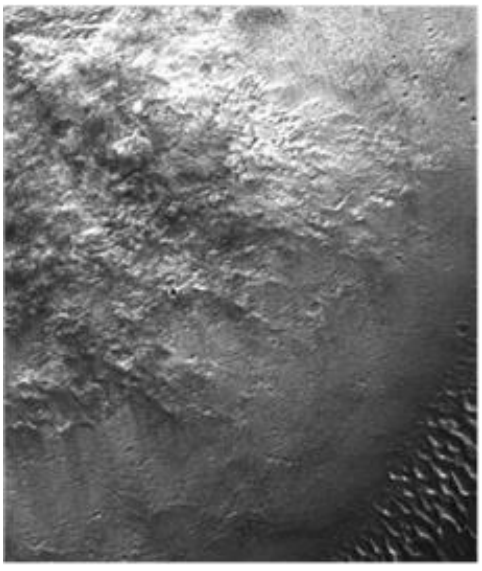

Figure 57. Face 5 from HiRise.

Figure 58. Face 5 annotated.

King's Valley overview showing the sculptor image

Some new features, possibly artefacts, were found in the HiRise images of the King's Valley. To save space just one of these is shown. It is called the sculptor because it looks like a humanoid figure that may have created the Faces. Its position is shown on the right in figure 59.

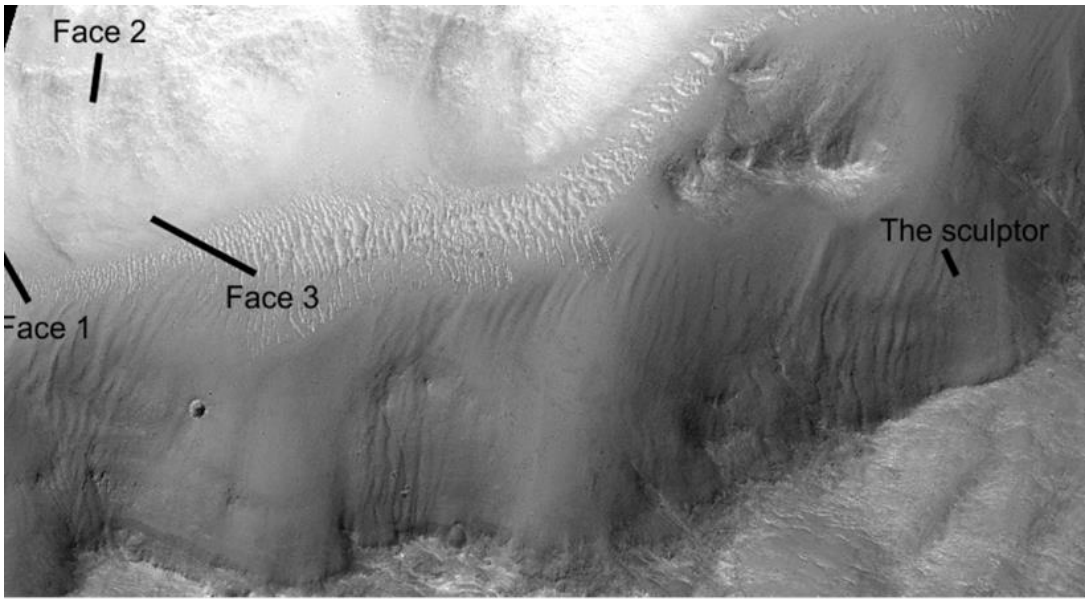

Figure 59. Overview of the King's Valley.

The sculptor

This figure should be impossible to form naturally because it seems to be carved into a smooth cliff face. Features around it have generally worn smooth, any other lines carved into the cliff may be associated with other artefacts. Figure 60 shows the sculptor. Figure 61 shows annotations. A shows some kind of oval shape apparently being held in the hand B. C and D show shoulders. F shows legs. These legs are also waves in the rock but the carved features go right over them, hard to explain geologically.

Figure 60. The sculptor.

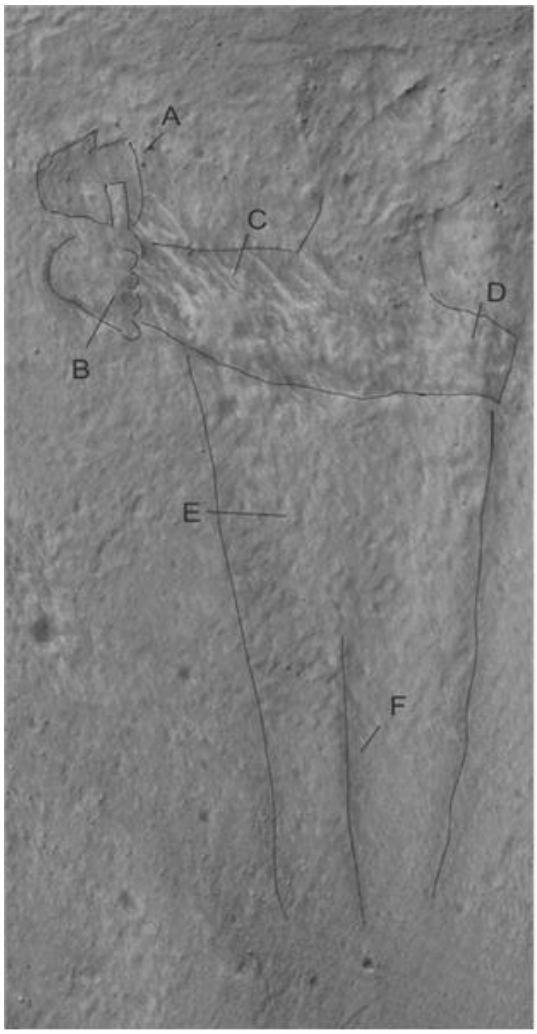

Figure 61. The sculptor annotated.

Looking right at the Crowned Face from the other side of the valley.

Figure 62 shows a close-up of the sculptor head. It looks directly at the three Crowned Faces on the other side of the valley. A shows a rounded skull carved into the rock, hard to explain with natural processes. B shows a brow line, the bottom of a hat, or a pair of eyeglasses. H shows the hair or a hat. G shows the back of the neck. C shows a nose outline in the right position. D shows an open mouth. E shows a chin. F shows the front of the neck.

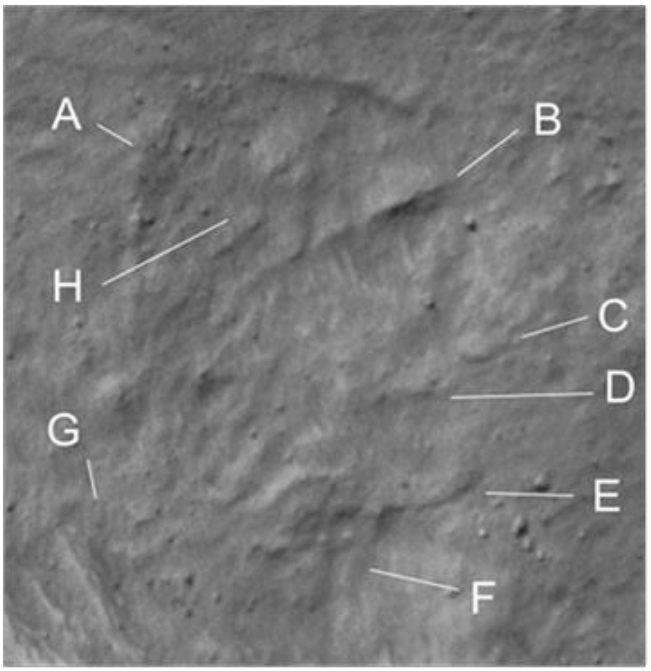

Figure 62. The sculptor head.

What is to be done now?

Is humanity's future best served by ignoring this or going there with a manned mission? Would you personally support visiting alien artefacts or are you against it? Why? Is it dangerous to go there or more dangerous to ignore this? These are not easy questions to answer. They are left up to the reader to decide.

A plan of action

A suggested plan of action, first reimage the whole area with HiRise at maximum resolution. The a priori prediction is that higher resolution will show more face like features and more similarities between them.

ExoMars landing sites

One of the proposed sites for the ExoMars rover is Southern Isidis, very close to the King's Valley. This is shown with the blue arrow in figure 63. With no extra cost we could have the ExoMars Rover at this site in 2018. Where better to look for life than around an alien artefact?

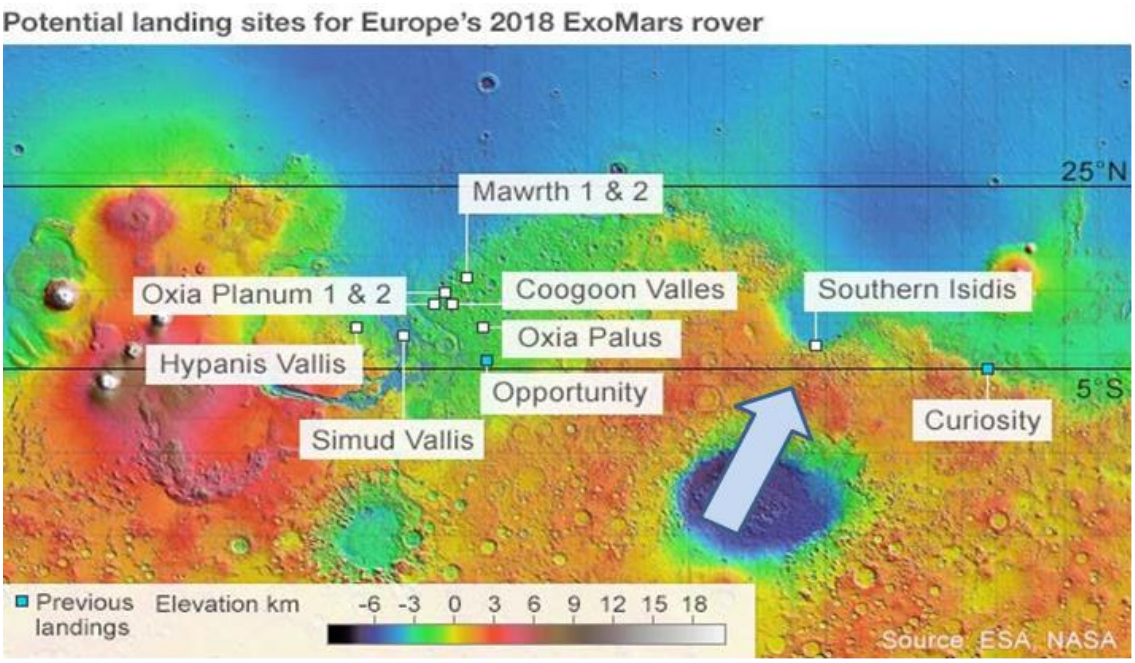

Figure 63. The proposed ExoMars landing sites.

The Curiosity Rover nearly went to the King's Valley

The ExoMars Rover can be there in four years. A plan of action, help us lobby for this. Figure 64 shows a proposed site for the Curiosity Rover, very close to the King's Valley.

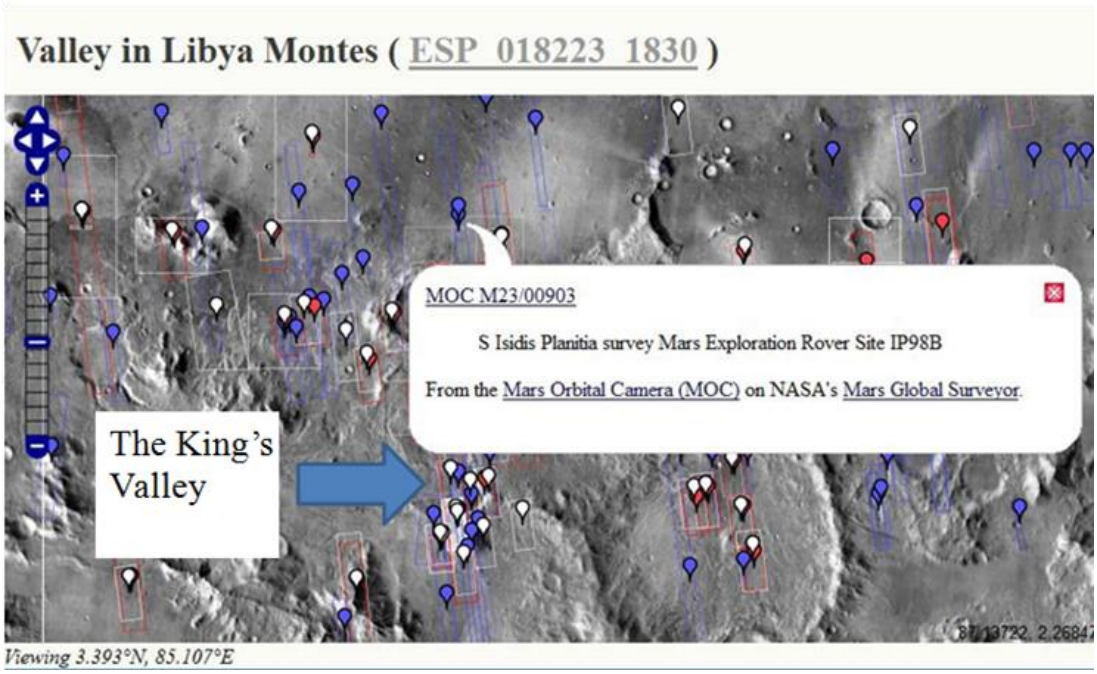

Figure 64. The King's Valley and a proposed Rover landing site.
Landing next to the King's Valley

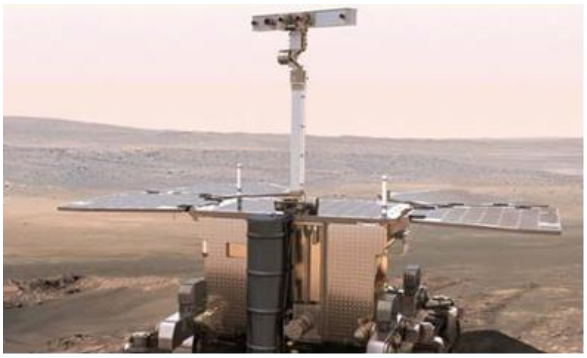

Figure 65. The ExoMars Rover.

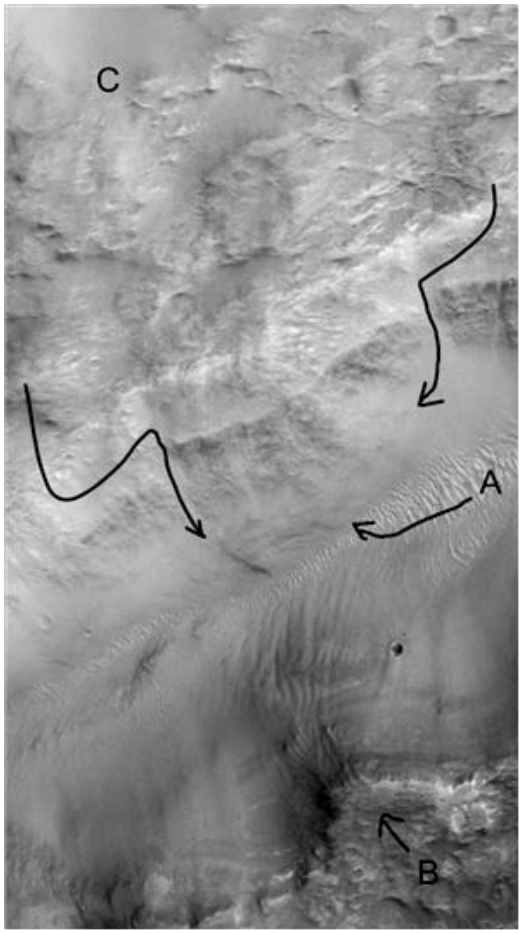

Figure 66. A proposed path for the rover.

Conclusion

The claimed proof of artificiality shows similarities between five faces to be higher than chance. 10^268 to 1 reduces to the absurd as claimed. Reducing this figure by any other means also reduces to the absurd. Many a priori predictions were confirmed with the odds against chance being between 10^6 and 5^35 to 1.Many facial features are shown to be either difficult or impossible to explain by geology.

The subject of alien civilizations is a mainstream not fringe part of science, SETI shows this. These artefacts are ancient and not associated with controversial fringe theories like UFOs and alien interference in human civilizations. Consequently they deserve mainstream attention and a concrete plan of action to explore them. Two are suggested, more HiRise images and sending the ExoMars Rover to this area. In four years we could be examining this site on the ground at no extra cost. We need a manned mission to the King's Valley.

The urge to explore these alien artefacts should be irresistible to the public and science, funding for a Mars colony will follow. This represents a game changer, more money into exploring and colonizing Mars to explore these artefacts will be good for science and scientists. They represent a win for everyone involved, we need to go there and soon.

References

[1]. Orme, G. and Ness, P., *Why we must go to Mars: The King's Valley* Createspace, 2011.
[2]. MOC images, NASA/JPL/Malin Space Science Systems.
[3]. HiRise images, NASA/JPL/University of Arizona.
[4]. Images of the ExoMars mission, ESA/NASA.

THE MERIDIANI FACE ON MARS

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Abstract

The Meridiani Face has some similar features to the Cydonia and Crowned Faces such as having a crown. It is similar to the Nefertiti formation in that it seems to be made of dark soil, dunes in this case. Some dark dune fields can migrate large distances in Meridiani Planum, others remain confined in larger craters perhaps by shielding them from the wind. This can allow for the formation to be very old and remain intact. The similarity between the Crowned Face in the King's Valley Libya Montes and the Meridiani Face was originally shown with an overall. The implicit hypothesis was that a new overlay would match the two faces even more closely, this has been borne out with the Crowned Face HiRise image and the Meridiani Face CTX image.

Keywords

Meridiani Planum; Barchan dune; Aeolian process; pareidolia; dune migration.

Introduction

The Meridiani Face was discovered around early June 2007 by a Mars researcher Terry James, it is shown in Figure 1. The null hypothesis is that this is a random dune formation, an example of people's innate ability to see faces according to Ellis and Lewis [3]. This can be falsified by the shapes of these dunes, to be artificial they would have had to be moved to their current positions. By comparing them to naturally formed dunes the discrepancies between the two processes are shown. Dune fields in Meridiani Planum craters are probably formed from layers of volcanic ash according to Tirsch et al. [7], these are usually constrained within the crater rim. One hypothesis is there is an unknown process stopping these dunes migrating according to Golombek et al. [6], saltation occurs as the dunes change shape but do not move significant distances according to Fenton et al. [14]. Another hypothesis is the crater rim shields them from enough wind to migrate them significant distances according to [14]. Cardinale et al [25] suggest the topography can account for the variations in the dune shapes such as in the Meridiani Face. Other possible artifacts on Mars, such as the Crowned Face in Libya Montes according to Orme [19], probably date to when Mars had a paleosea and thicker atmosphere. To have a common origin the Meridiani Face should have an equivalent age of several billion years.

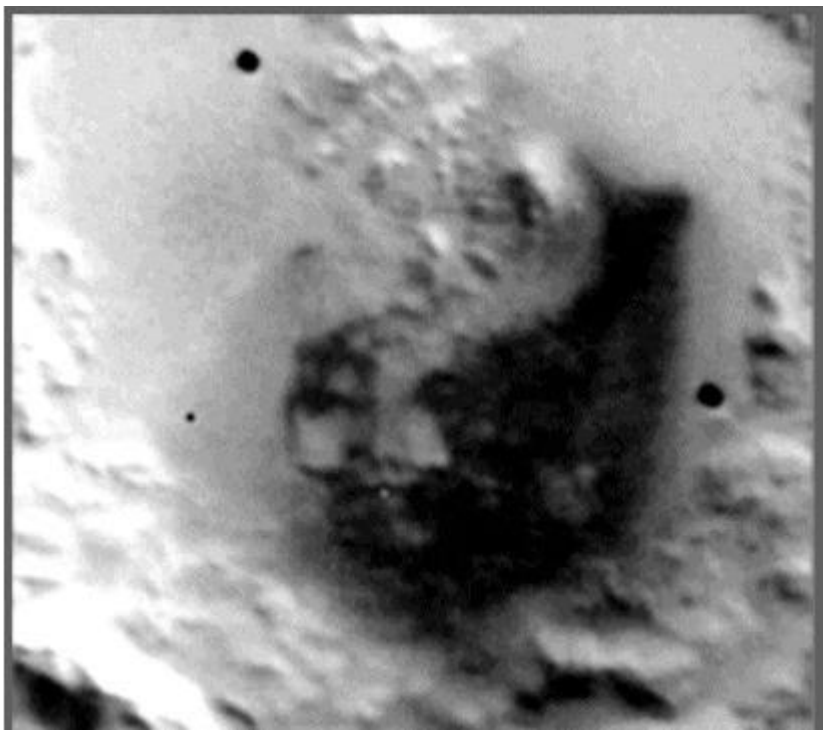

FIGURE 1. THE MERIDIANI FACE.

Pareidolia

Recognizing faces, often referred to as pareidolia, is sometimes considered to be an innate ability people have according to Lewis and Ellis [3]. Inverted faces are more difficult to recognize according to Yin [15], also the more distorted or jumbled they are the more time it can take to recognize them. It can then be a different kind of ability according to [3]. Inverted faces are more difficult to recognize [15], also the more distorted or jumbled they are the more time it can take to recognize them. A special part of the brain may recognize faces but not other kinds of shapes according to Aguirve and Farah [13], this can relate to Martian formations, This problem has often occurred as researchers examined Mars images for possible artifacts. Amateurs and scientists such as in the Society for Planetary SETI Research [26] originally began this research because of the public availability of these images from NASA online. Some then found face like or other artificial looking shapes such as the Cydonia Face, analyzed by Carlotto [9]. Many could be explained by pareidolia while a few were much harder to dismiss. O'Leary [1] was another of the first peer reviewed papers to examine the Cydonia Face in the Viking images. Other papers trying to form a hypothesis about these formations included DiPietro et al [23]. While the face was most easily recognized and caught the attention of the public, others formations were found such as a complex geometric pattern of mounds according to Crater and McDaniel [17].

Lewis and Ellis [12] also question as to whether our expertise at recognizing faces is instinctive or comes with experience. We might then be more familiar with faces and preferentially search for them in clouds, hence the term pareidolia. It begs the question then as to whether researchers have found some faces on Mars because those artifacts happened to be faces, or because they kept looking for things they would unconsciously recognize like a Rorschach Test of inkblots. In this hypothesis, the variations in Martian topography would create so many random shapes that researchers would find whatever they unconsciously wanted to. This can give rise to a circular argument that the faces should be dismissed because they look too much like us. However, a similar argument might be made if they did not look recognizably organic, that they should be dismissed as merely an unusual unknown shape.

Purcell and Stewart [24] found that a conventional face was more quickly recognized than a jumbled face, however researchers looking at tens of thousands of Mars images usually take their time rather than jump to conclusions. They often turn an image around and zoom into some areas, it is unlikely then that rapid analysis of images like in this experiment preferentially led to faces being found. Also, many have been found at different orientations with few happening to be vertically orientated or in pristine condition. Lewis and Ellis [12] suggest there may be a special part of the brain to detect faces, however this is not known to exist as a certainty. Other shapes such as of buildings, birds, and fish have also been found which would not use this specialized ability. Also, the Martian faces are not recognized by face algorithms like on Facebook, they then appear humanoid but people rarely see them as looking exactly like humans.

Liu et al [21] conducted an experiment to see how people detect faces in noisy data. In some cases, this can happen in Mars images when the objects looked for are small or the image has blocky JPG compression. However, the Meridiani Face is quite large and was even visible in the Viking images with a resolution of tens of meters per pixel. As will be shown, very small details are visible in the latest HiRise images as small as in centimeters per pixel. Sheen and Jordan [5] discuss how pareidolia might occur with low light conditions, however the dark dunes of the Meridiani Face have a high contrast against the light topography of the crater. There is then little noise and fuzziness in these images, the data looks like a face nonetheless.

Another problem with the pareidolia argument is that it arose when the Cydonia Face was first discovered in the 1970s, with only one example there was no basis to say that the Martian surface randomly produced face like shapes. Faces have been extremely rare to find on Mars, out of over a hundred thousand images only four locations have them. If researchers were prone to pareidolia then there should have been perhaps hundreds found in so many images. Later when reimaged the Cydonia Face looked more eroded and less face like, but it also showed more artificial looking features. This lesser similarity to a face was seen as more evidence it was natural, but this relied on the same argument used to call it an illusion. It is not scientific then to dismiss face shapes as innately implausible and then also claim that being less face like is plausible evidence. We do not know who if anyone might have built these formations so we have no way to ascribe any probability to their being artificial. Our preconceptions as to what kinds of alien artifacts might be found come from science fiction, which amount to a set of unproven hypotheses. As described in Orme [20] Mars had a paleosea for a billion years, it may be sentient life evolved there. Many planetary scientists are convinced simpler life forms did so the uncertainty may be how evolved this life became.

To avoid these preconceptions based on facial comparisons to humans, researchers have tried to falsify geological explanations or show that the level of detail is very unlikely to occur by random chance. The issue with the Meridiani Face explored here is not how face like it is, but whether dunes could naturally form in those shapes. It follows that if it is artificial that these dunes must have been moved, if the dune positions are impossible then it must be artificial. For example, if we saw Martian dunes spelling out words then this would be demonstrably impossible because dunes form with the wind coming in a single direction. This wind could not twist the dunes into letters, if there were enough words then this would be too unlikely to occur by chance. In the same way it is argued the Meridiani Face has too many unusually shaped dunes to be formed by Aeolian processes. A second hypothesis is that the Meridiani Face is a reproduction of the Crowned Face in the King's Valley in Libya Montes. The geological processes are completely different, the Crowned Face there is on the side of a valley wall and contains no dunes.

Another preconception that causes problems is the lack of an explanation as to who could have created these formations. This necessitates more speculations and hypotheses that will turn out to be inaccurate, but an attempt must be made to give an overall model not just concentrate on isolated formations. These speculations are explained in depth in Orme and Ness [27] but there are two main hypotheses. One is that indigenous life arose about 4 billion years ago, when Mars has a paleosea for about a billion years. When Mars cooled they then died out, this is explored more in Orme [20]. The second hypothesis is that aliens or a Dyson probe came to our solar system with the intention of seeding it with their life, terraforming Mars in the process. In both cases the warmer period in Martian history is proposed to have been initiated by a shallow meteor impact creating Argyre Crater. This was either deliberately directed at the pole or happened by chance, it melted the water ice and the frozen atmosphere at the pole creating a short-lived period when life could evolve or flourish.

Geology of Meridiani Planum

Arvidson et al. [16] discuss the Terra Meridiani region of Mars as being Noachian aged, highly cratered terrain. This is significant because if the Meridiani Face is artificial it would have had to last for billions of years from the Late Hesperian to Late Amazonian. Hematite bearing deposits are observed, Tirsch et al. [7] suggest the dark dunes in these craters come from layered deposits exposed by their meteor impacts. Aeolian stripping produces much of the landforms seen today. Chojnacki et al.[16] discuss more of this Aeolian driven bedform activity, this has shown unambiguous dune activity of migration and deflation across Meridiani Planum. The null hypothesis here then is that the Meridiani Face is a random formation of dunes, this migration observed is in some areas fast enough to destroy any artificial face made of dunes over tens of thousands of years. Some dome dunes have moved from 4-12 meters per year, however this is unlikely to be occurring with the Meridiani Face because it was first visible in the 1970s with Viking imagery. This recognizable face has persisted with the Mars Orbital Camera and now the HiRise images.

Some of the dunes in Endeavour Crater Meridiani Planum are shown in Figure 2. Generally, they point in the same direction, to the upper left though some may be affected by the crater rim in the bottom of the image. However as will be seen, the Meridiani Face has dunes going in all directions even crossing over each other. It is proposed the same Aeolian processes in Endeavour
Crater should be operating on the Meridiani Face as well. The complex dune shapes of the Meridiani Face should then be a random variation of known dune fields elsewhere in Meridiani Planum to confirm the null hypothesis.

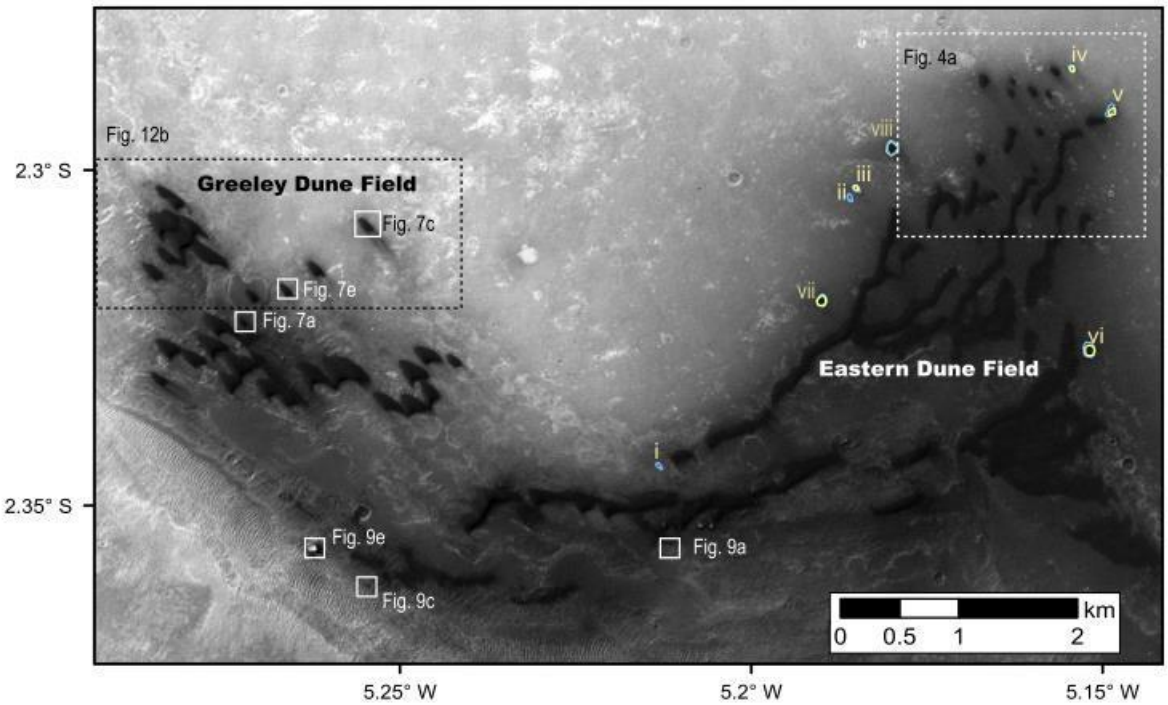

FIGURE 2. ENDEAVOUR CRATER.

These dune turnover times are estimated to be considerably shorter than the Martian obliquity cycles Chojnacki [16], there would then need to be other factors that prevent the dunes in this crater from moving substantially over long periods. One hypothesis is that the Martian poles change their obliquity at regular intervals De Haas [10], this may melt the ice at the poles and thicken the atmosphere. It is suggested this contributed to the widespread occurrence of midlatitude gullies and small catchment-fan systems. There are no clear estimates of the amount of liquid water generation during these periods, if these were extensive then atmospheric precipitation and Aeolian erosion might have destroyed the Meridiani Face long ago.

Because it would need to be as old as the other proposed artifacts this would make it more likely to be a random formation confirming the null hypothesis. However, this obliquity theory is not proven, it has the problem of creating more recent atmospheric precipitation and fluvial erosion that is not seen according to other estimates. We should for example see multiple instances of flooding in these fluvial valleys each time the axial tilt increases but there is no evidence of a recurring paleosea younger than around 3.2 billion years ago. It may then be the air pressure on Mars has remained low or the crater rim shielded the Meridiani Face since the Argyre impact and the subsequent warming of Mars described in Orme and Ness [27]. After the effects of the Argyre impact wore off then Mars may have reverted to a near vacuum in its atmosphere allowing these dunes and other possible artifacts such as the Crowned Face to survive with minimal erosion. Another Mars face called Nefertiti, from its resemblance to the Egyptian queen, has the same problem of surviving long term erosion according to Levasseur et al. [2]. In Figure 3 Endeavour Crater is shown with its location compared to the Meridiani Face.
Endeavour Crater
is at 2.3S 5W while the Meridiani Face is at 7.3N 7.4E, both then are near the current equator and should experience similar climates.

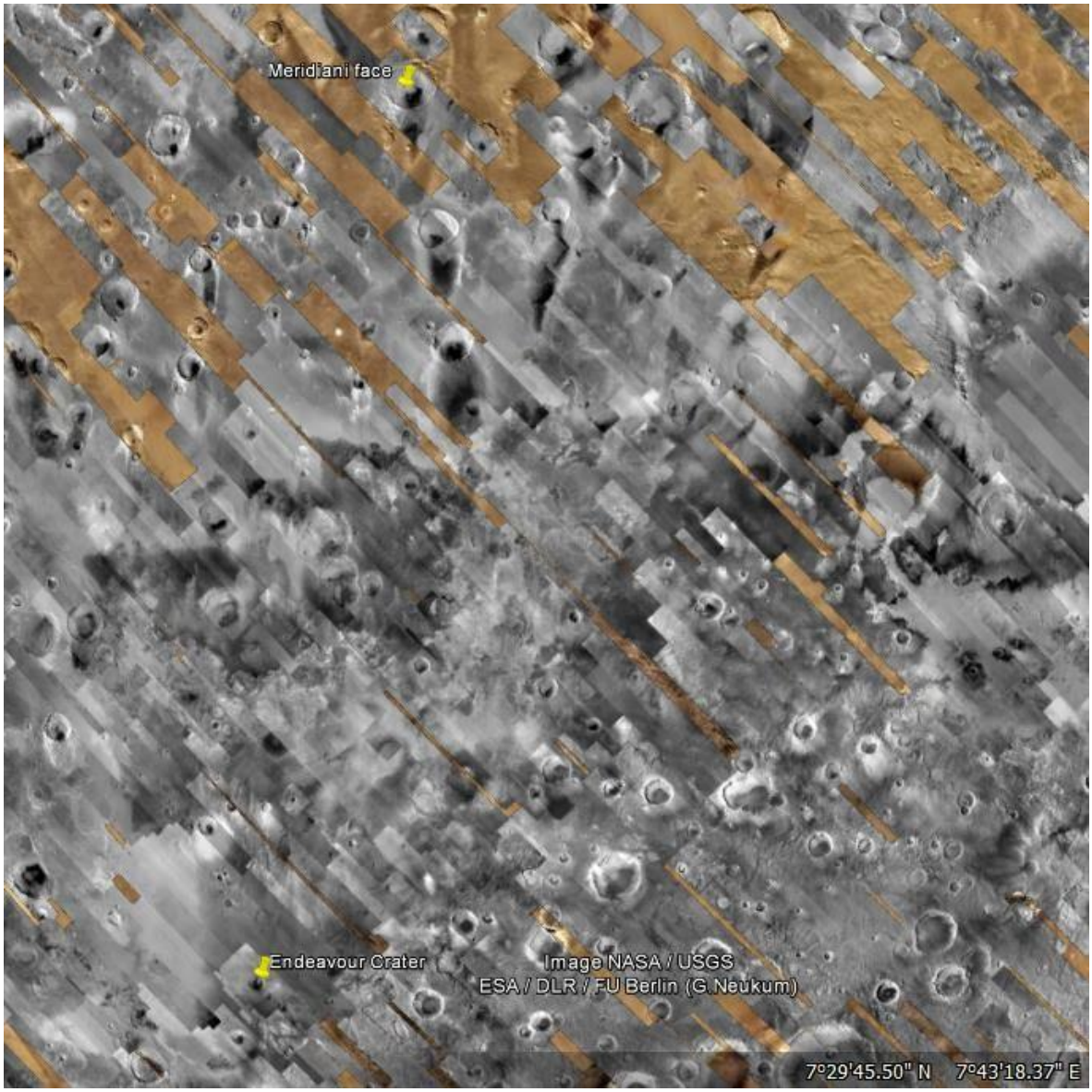

FIGURE 3. ENDEAVOUR CRATER AND THE UNNAMED CRATER CONTAINING THE MERIDIANI FACE.

Fenton et al [14] discuss how the east-west oriented bedforms and hence this wind direction is the oldest wind erosion seen, earlier than 200,000 years. Sometime between 50,000 and 200,000 years ago the wind shifted to the northeast-southwest seen in crestlines, these reworked the earlier east-west plains ripples. More recently the winds shifted to the northwest-southeast. Their Figure 5 shows Rose diagrams of wind directions which are consistent over large areas of

Meridiani Planum. They find a lack of ripple migration from their source regions, this would indicate the dunes of the Meridiani Face may not have moved significantly over time, shown in their Figure 14.

The changing wind directions might also have cancelled out some of this movement, if the wind changes direction and then reverts to an earlier direction over tens of thousands of years then this might prevent some of the degradation of the Meridiani Face. They give as an example a massif in their Figure 6b on the eastern rim of Miyamoto Crater. They see a movement of one wavelength or 30 meters from this source region, a similar movement in the Meridiani Face might then preserve its shape if all the dunes moved together while holding their shape. This is unlikely however as a constant wind direction from the northwest should affect dunes at different orientations unequally. The face appears degraded in many areas so this dune movement may be slowly destroying it. Golombek et al. [6] discuss how a secondary crater is equally modified by plains ripples indicating these dunes are not migrating from one crater into the other. This is similar to dunes seen in the Argentinian Puna where ripples are sites of sediment nucleation but do not move downwind even with active saltation. There is then an unknown cohesive process that is stabilizing these bedform surfaces. Continued saltation erodes the windward ripple slopes without migrating the dunes. Figure 4 shows the orientation of the Meridiani Face, north is vertical in the image. The dune fields may be migrating from east to west implying it is from this oldest wind erosion.

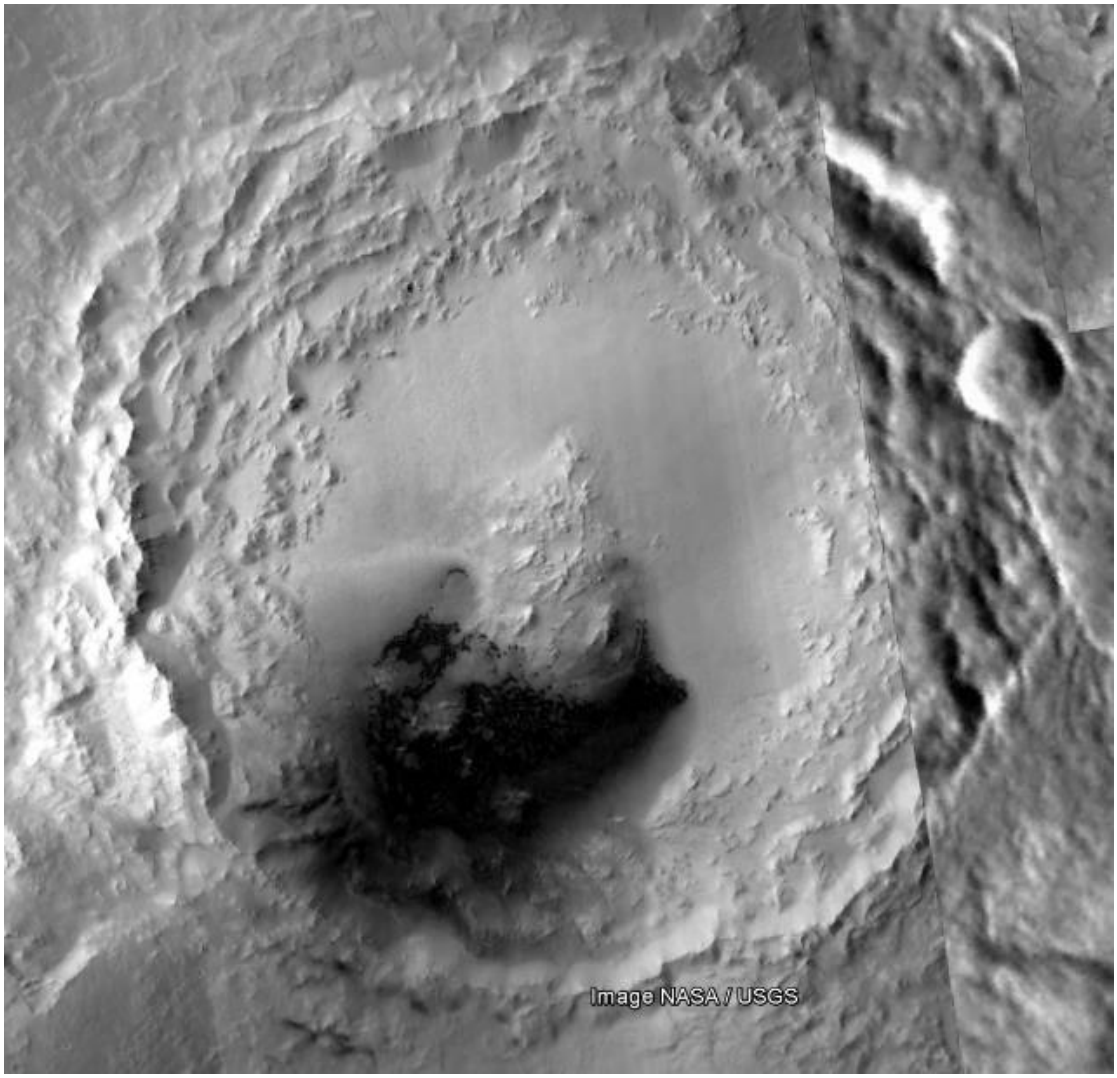
Image NASA / USGS

FIGURE 4. ORIENTATION OF THE MERIDIANI FACE.

According to Fenton et al [14] the transport of dark sand in small craters in Meridiani Planum is dominated by a south east wind. This gives dark sand accumulations on the north side of many craters. By contrast the dark dunes of the Meridiani Face seem to be moving to the east of the crater, why this varies according to crater size is not known. The authors suggest the Froude values differ between smaller and larger craters, as the Meridiani Face crater is large the wind may be diverted around it so the dunes migrate much less in it.

Burke [4] discusses Barchan dune asymmetry, she presents a Barchan limb classification system of linear, kinked, and beaded. Because many of the dunes making up the Meridiani Face are crossing each other and in different orientations it may be some have morphed from different wind directions or dune collisions. The variations in topography might also affect their shape. These dune limbs can then indicate the direction and strength of formative oblique winds; a longer limb length might indicate this oblique wind had a longer duration. However as will be shown these dunes in the Meridiani Face do not have the same shape as those formed by oblique winds. Different shapes of these dunes are shown in Figure 5a-d.

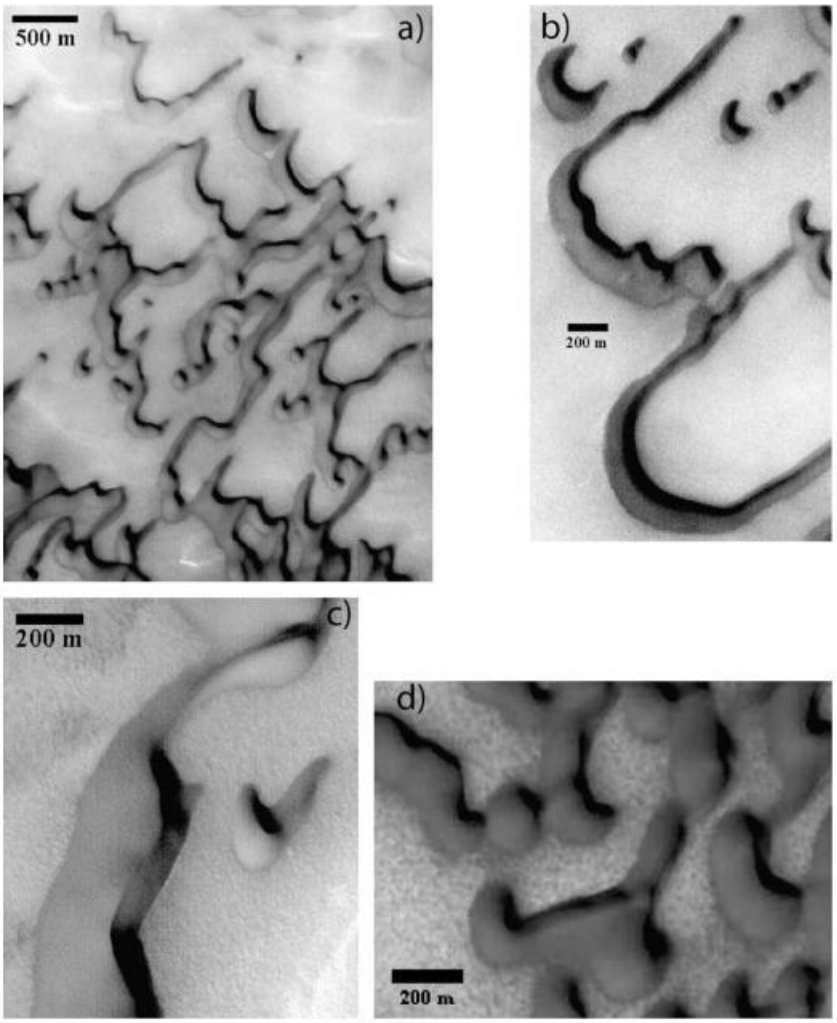

FIGURE 5A-D. BARCHAN DUNE ASYMMETRY.

Cardinale et al. [25] conclude that dune fields in Moreaux and Herschel Craters are formed by topographically controlled wind directions. This they say did not occur from paleo-wind regimes suggesting these dune shapes were formed more recently. If the topography then around the Meridiani Face could influence the dune field shapes then perhaps it could create this face shape naturally. In some cases, these topographical variations can accelerate the wind velocity affecting the dune shapes. Some of these are shown in Figure 6a-f. However, these dune fields show a gradual change in direction, for example in Figure 6e the dunes change their orientation in a

smooth way from the left to the right and this angle is relatively small. The Meridiani Face contains a jumble of crisscrossing dunes with no smooth change like this, the wind would have to change over a scale of several meters and then maintain this for tens of thousands of years or more. Wind cannot do this, also this occurs where the topography is flat with only some small ridges unrelated to the dune shapes. If these dunes comprising the Meridiani Face are much older then this chaotic wind pattern might have had to exist for billions of years.

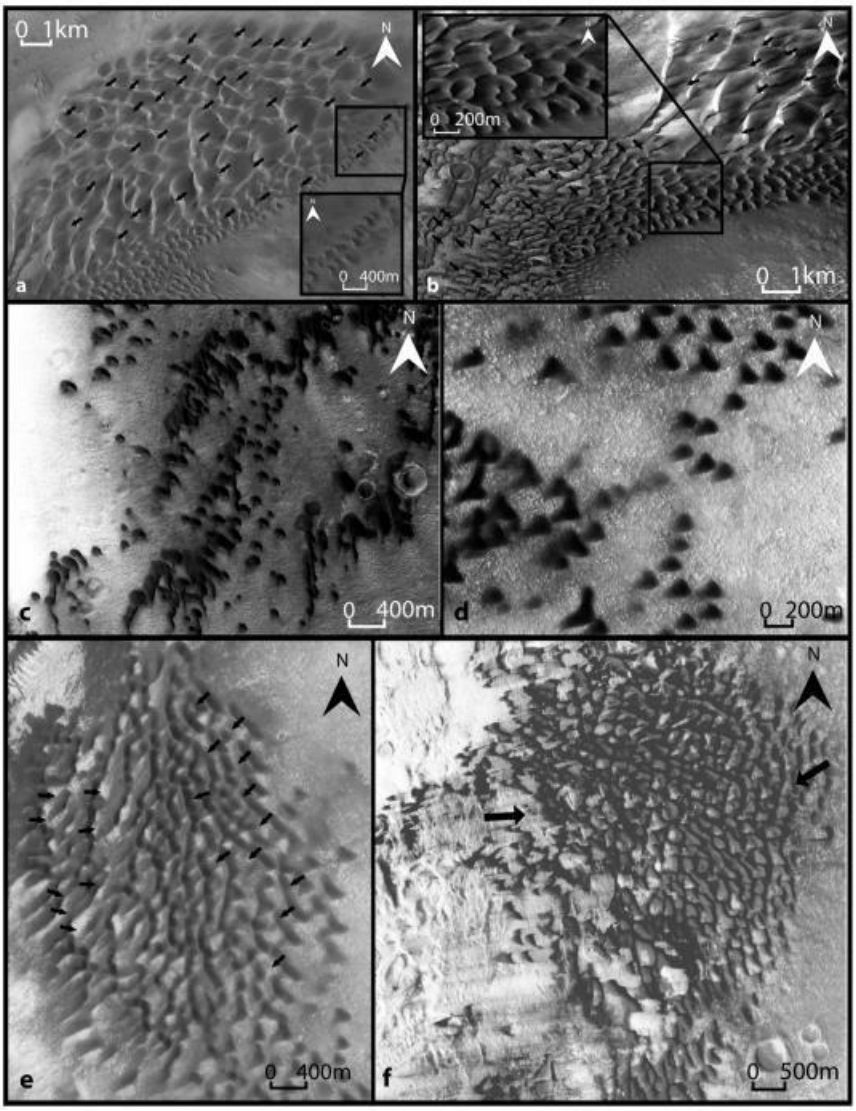

FIGURE 6A-F. A CONVERGENCE OF SEVERAL WIND DIRECTIONS.

Geissler et al [22] discuss why some dune fields do not seem to change over time. It is also not known when these changes occur, whether they are gradual or have occurred at particular times in Martian history. Some dune slip faces are advancing approximately 50 centimeters a year while other Aeolian ridge deposits show no changes. These blowing sands are actively altering the Martian landscape, such as eroding sedimentary deposits in Becquerel Crater. They discuss an unnamed crater shown in Figure 7, from CTX image B17_016459_1831. In this crater the bedrock is eroded into flat-topped mesas bounded by scarps much steeper than those under the Meridiani Face. These may have caused some changes in wind direction, the dune fields show some different orientations on the upper left and right of the image. These mesas are suspected of having been formed by sandblasting, the gentler topography around the Meridiani Face might also have formed this way.

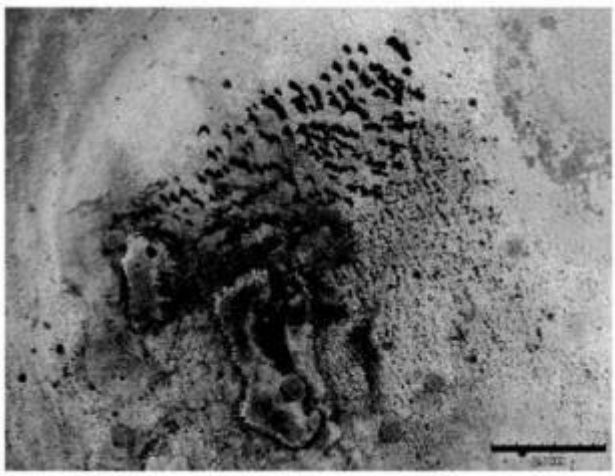

FIGURE 7. SAND DUNES AND ERODED MESAS IN MERIDIANI PLANUM.

Tirsch et al. [7] focus on the dark sediments in Martian craters, this indicates material transport from layers under the crater to these dune fields. This dark sediment appears to emerge from beneath the crater floor. This is significant because it indicates that these craters have retained their dune fields from the times of the original impacts. Because many of these craters are very old it implies the Meridiani Face dune fields could have stayed in the crater rather than having migrated into it from elsewhere. If these dune fields are this stable, then over perhaps billions of years the face could have survived for this long. These layers may be volcanic ash globally distributed in the Noachian. Impact erosion after the wet periods on Mars then would have exposed these materials, however they have not migrated far since then.

The Meridiani Face

The Meridiani Face created some excitement among researchers when it was first discovered, some skeptics even accused NASA of having their database hacked and this artificial image inserted in it. This could also be an effect of pareidolia as Lewis and Ellis [12] discussed, it may be that random faces sufficiently like our own suddenly trigger this innate ability creating a shock of recognition. Rosenthal-Von Der Pütten et al. [11] discuss this uncanny valley effect where if robot faces are too similar to humans it creates a shock or even fear in the observer. There can then be a psychological aspect to skepticism about these faces, perhaps from this uncanny valley effect of their being too like our own. This is a common reaction in many people bordering on xenophobia about the subject.

Chojnacki [16] discuss how dune fields can move large distances in Meridiani Planum, however these dune fields would be on the rim of the crater or moved beyond it by now. Figure 8 shows how this dune field may be migrating to the upper right, the dunes are at right angles to this wind direction. The dunes that form the face differ radically in their orientations as shown, unless this is caused by the topography then the hypothesis is someone moved these dunes into the face shape.

Cardinale et al. [25] discusses how the topography can change wind directions in a crater, over the left eye in Figure 8 the dunes have a different orientation to over the right eye. The higher elevation of the topography above these eyes would be a natural hypothesis to explain these dune orientations. In between the eyes the dunes go vertically up the image to make the nose shape, but the same topography should not have made such a sharp change in dune orientation. Geissler et al. [22] discuss how some dunes do not appear to move at all on Mars since they have been observed. Another hypothesis is the face was originally carved from the rock and these dunes have protected some parts of it, the rest of the face being sandblasted away over time from the sand grains off these dunes. This would then retain some of the face shape and constrain the movements of the dunes. For example, if the original eyes were depressions these may have filled with dark sand grains and retained their shape.

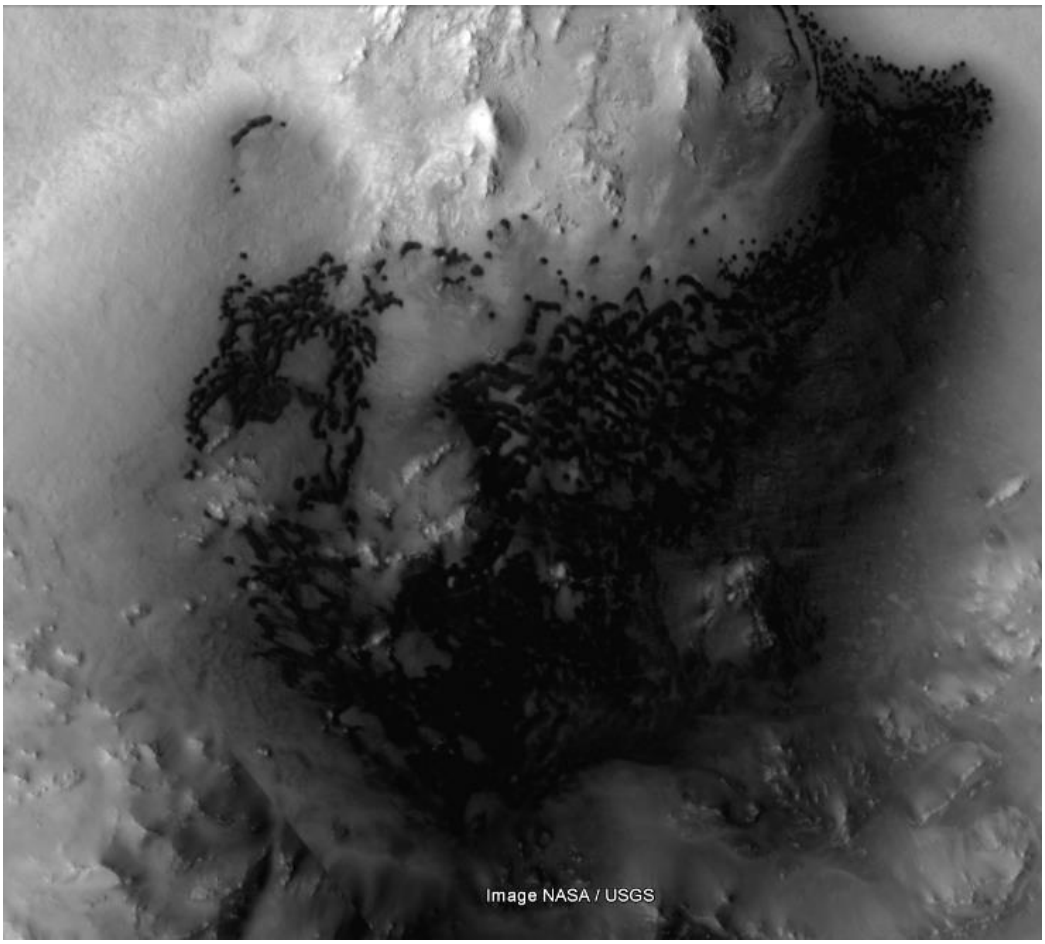

FIGURE 8. THE MERIDIANI FACE.

The left eye

The left eye of the face is shown in Figure 9, the dunes on the right point in a different direction to those on the left. Also the dunes seem to change direction around the eye but the wind should make them all point one direction as discussed. If the wind had changed direction, then this would create a rippling or hatching across the dunes which is not seen here. The pupil is also one large flatter area rather than a dune shape. Some of the ridges shown may also have been designed to hold dunes in place as part of the face shape.

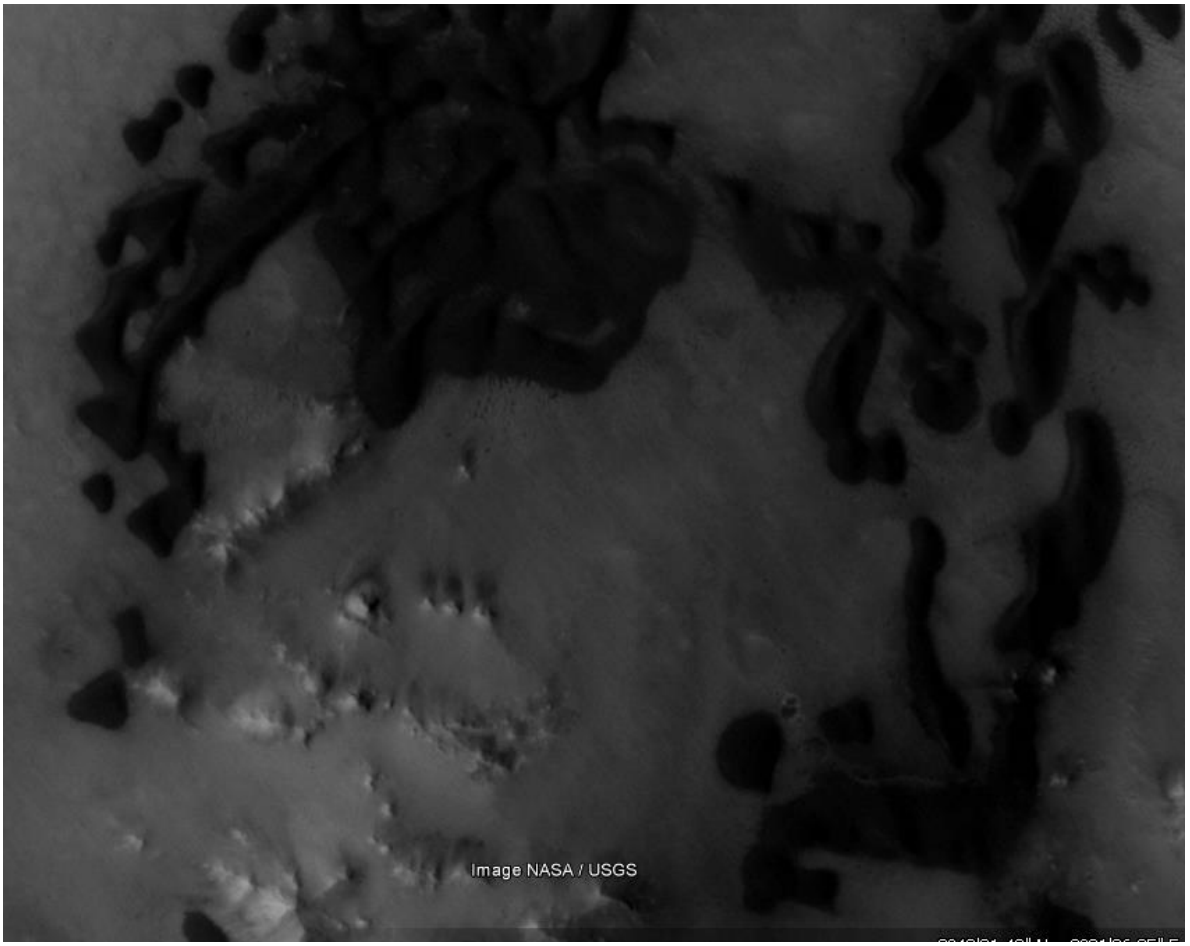

FIGURE 9. THE LEFT EYE.

Below in Figure 10 some features are analyzed. At A the dunes making up the left eye point in two directions but are just tens of meters apart. This is consistent with their not being natural dunes but placed there to act like pixels, or with this level of technology brushstrokes of an image. The process of creating dunes is that the wind blows from one direction and creates dunes at right angles to it. This wind cannot then blow from another direction to make dunes at a different angle without changing the first set of dunes. Wind can cannot vary in its direction over tens of meters consistently like this would have had to. Also if this created turbulence enough to change the dune directions it would destroy the clean dune shapes, the ground between them would be dark with sand.

B shows an S shaped dune that is hard to explain with the natural hypothesis, it would appear as if the wind was blowing in a different direction in the various dune segments. C shows 3 dunes joined together like a W, the wind would have to come from 3 different directions without affecting the other dunes. These may also be constrained by ridges under them not visible. Burke [4] discusses the different morphologies of Barchan dunes, particularly with oblique winds. None could make a shape like B or C, it is not clear which direction the wind would have been coming from and which parts would be the limbs of the dune.

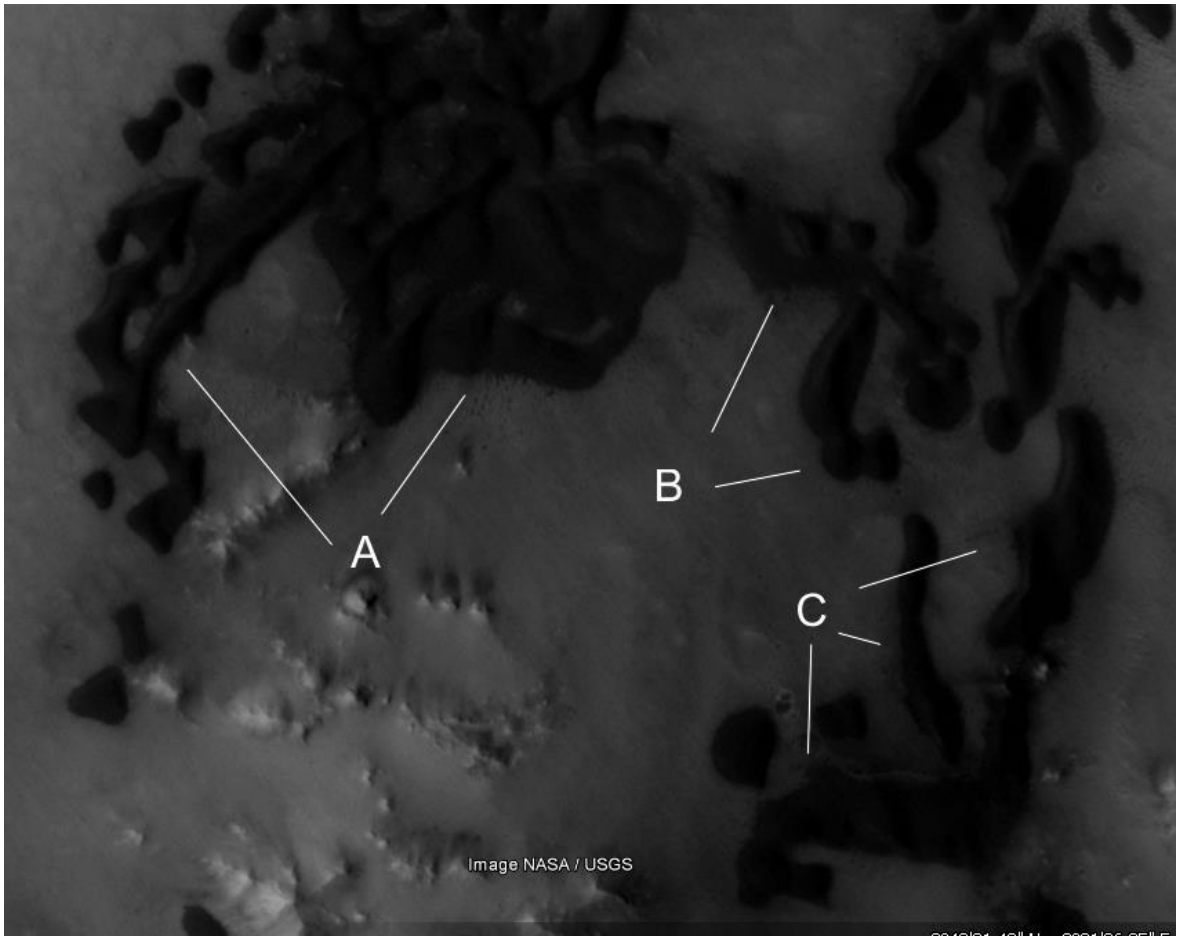

FIGURE 10. THE LEFT EYE ANNOTATED.

The right eye

Figure 11 shows unusually shaped dunes around the right eye. A shows the pupil in the right position, nearly all the other dunes are long and thin like hatched brushstrokes of a drawing. B shows each dune around it is pointing in a different direction, there is no significant variation in topography as Cardinale et al. [25] discusses to account for this. Also, there are no clear limbs off barchan dunes here as Burke [4] discusses. This is then different to the upper right of Figure 8 where the dunes point in approximately the same direction. C shows these different dune directions, also that they cross over each other or collide in dozens of positions. It is not clear how a dune can cross another one without disturbing the shape of the one underneath. Burke [4] discusses many kinds of Barchan dune asymmetry but these dunes are not the same shapes as those identified. Most have no clear shape like in Figure 2,5, and 6. She also discusses how dune collision can alter their shapes, however the dunes here point in all directions at B and C, to be colliding they would have to have the wind moving in all these directions at once. If the topography is controlling their movement, then there may be more ridges under these dunes.

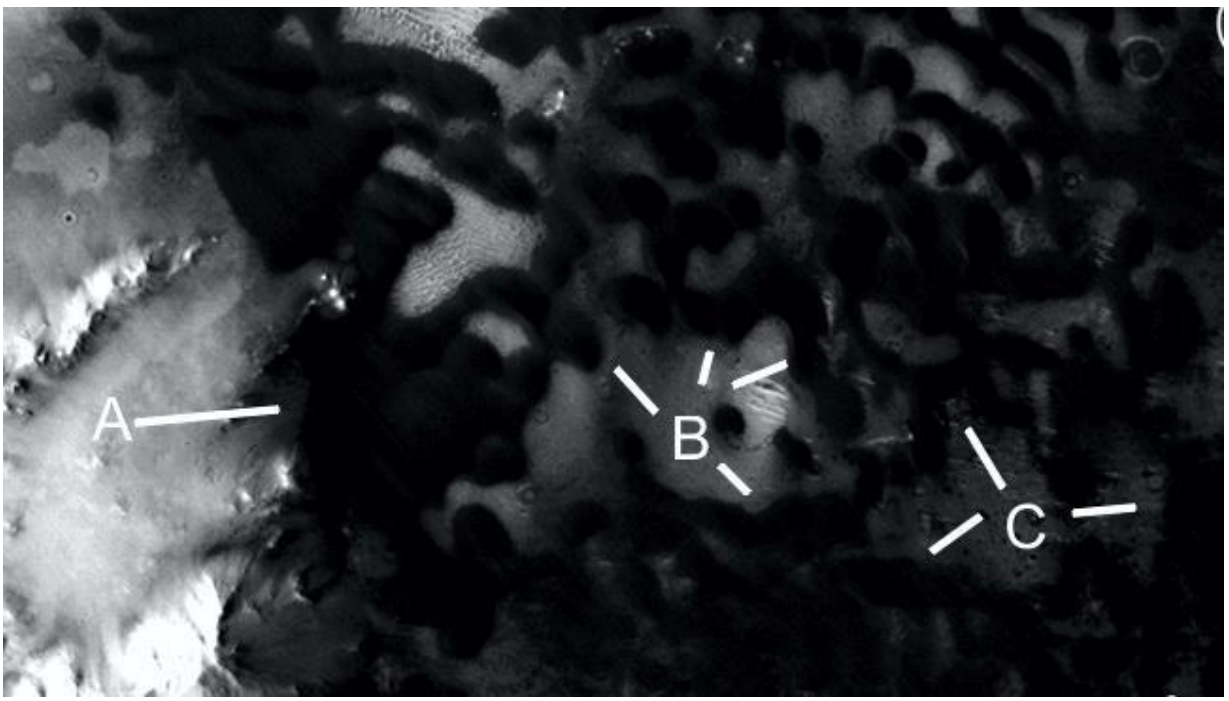

FIGURE 11. THE RIGHT EYE.

Dune fields in Meridiani Planum

These images show nearby dune fields to the Meridiani Face. Their shapes can be compared to the dunes making up the face.

Image ESP_036027_1865

Figure 12 shows dunes pointing in approximately the same direction. Some have elongated limbs from an oblique wind as discussed by Burke (2010). This is different from the Meridiani Face because there are none crossing over each other or pointing in opposing directions.

FIGURE 12. NO DUNES COLLIDING OR POINTING IN OPPOSING DIRECTIONS.

Image ESP_023764_1870

This image shows the dune field disintegrating at the bottom, perhaps from the topography. The dunes are generally pointing in the same direction with some elongated limbs. Both these images have smaller and narrower dunes, the Meridiani Face has much longer dunes.

FIGURE 13. DUNES POINTING IN THE SAME DIRECTION.

Image ESP_036159_1905

These dunes at the bottom of the image appear to be controlled more by the topography, in some cases joining together on one end as with parts of the Meridiani Face. The orientation of the dark dunes is similar to the lighter dunes in the bottom middle of the image, on the right they turn clockwise perhaps 10°. These dunes are also longer like in the Meridiani Face. Cardinale et al. [25] discusses how the topography can change the wind direction, also shown in Figure 6.

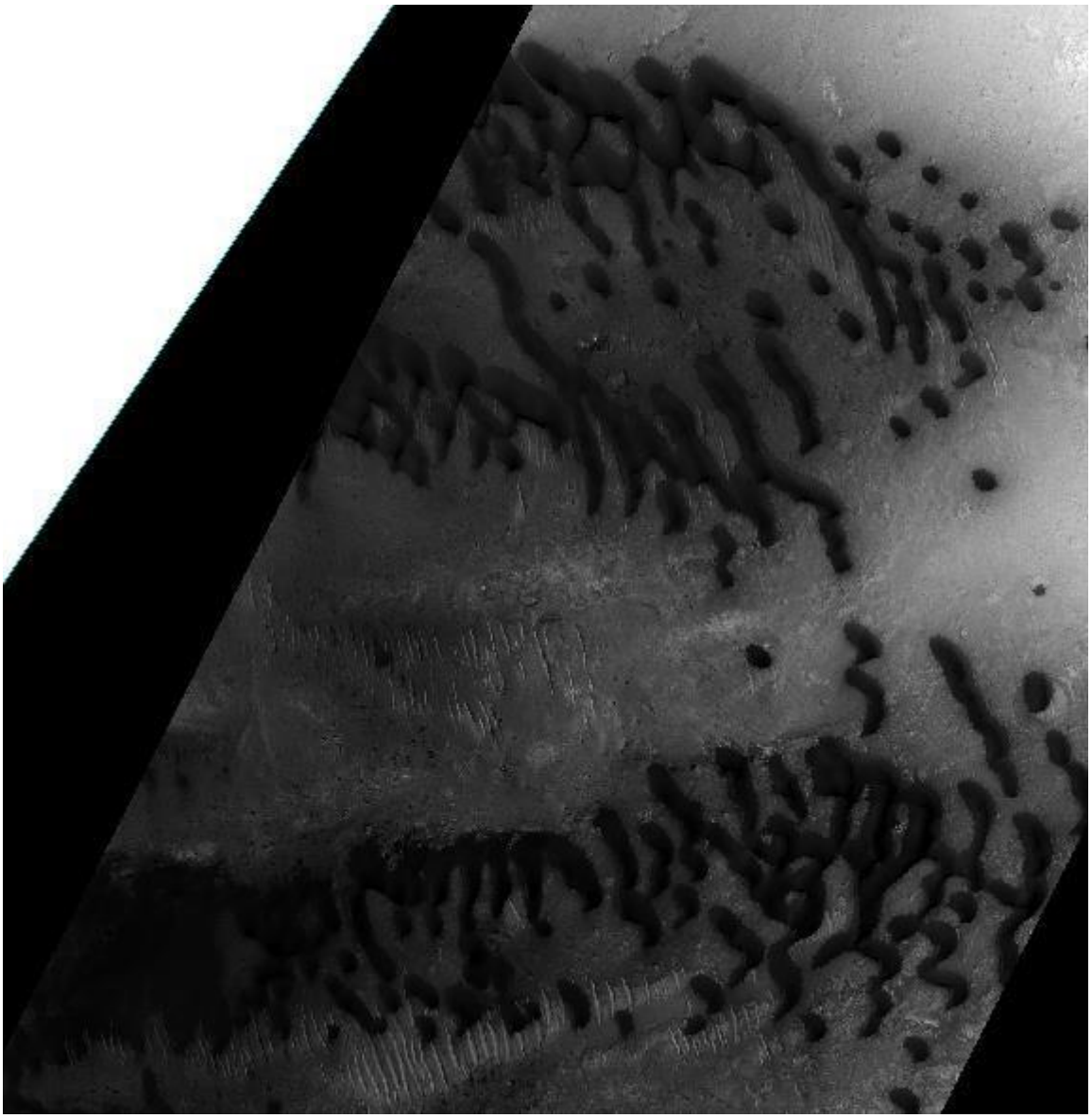

FIGURE 14. CONNECTED DUNES LIKE IN THE MERIDIANI FACE.

Image ESP_024608_1870

These dunes generally point in the same direction, not crossing each other like in the Meridiani Face.

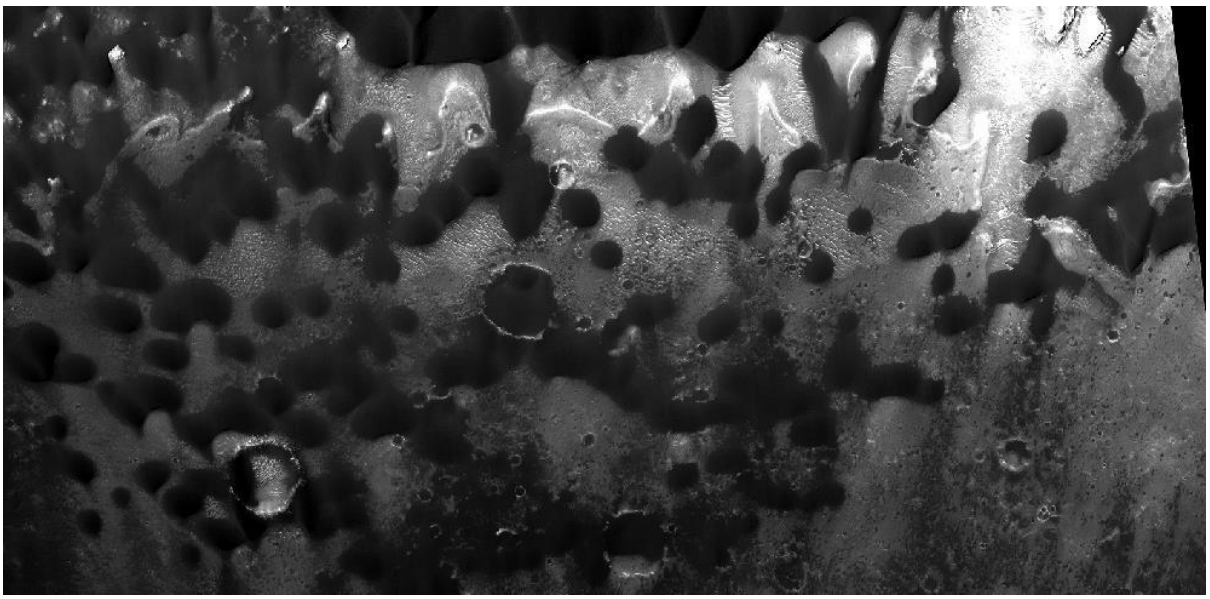

FIGURE 15. DUNES POINTING THE SAME DIRECTION.

Image ESP_028498_1895

These dunes are oriented in different directions much like in the Meridiani Face. This has probably happened because of a shifting wind direction; it is also making the soil around them darker as the dunes disintegrate. However, this is not happening in the Meridiani Face as the soil remains light there. Some parts are concentrated like the pupils in the face. There are also signs of ridges perhaps controlling the dune shapes, there may be more under the dunes.

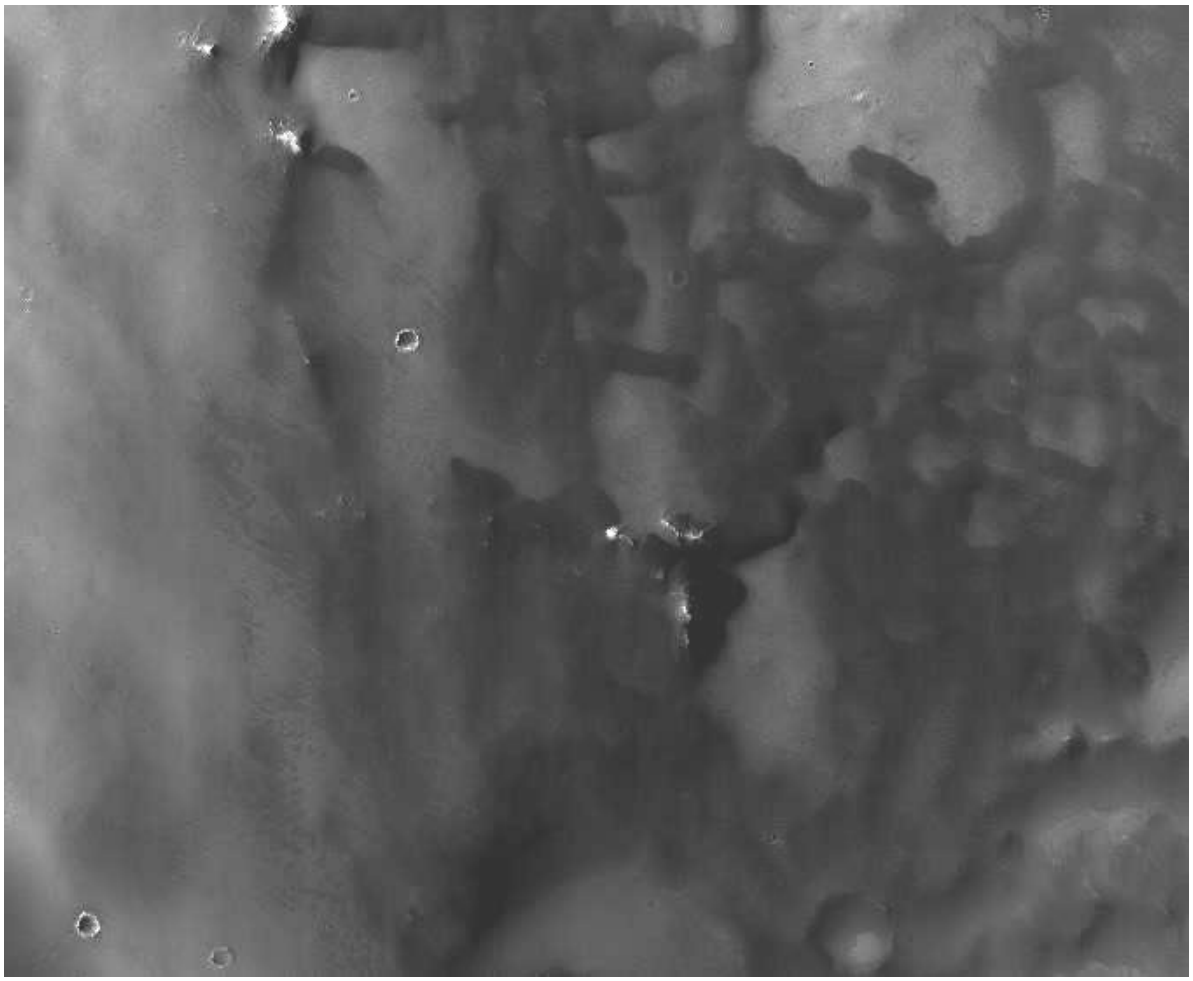

FIGURE 16. DIFFERENT DUNE DIRECTIONS.

Image ESP_020085_1900

This shows the topography in the crater north of the Meridiani Face. A similar terrain may be under the dunes in the face.

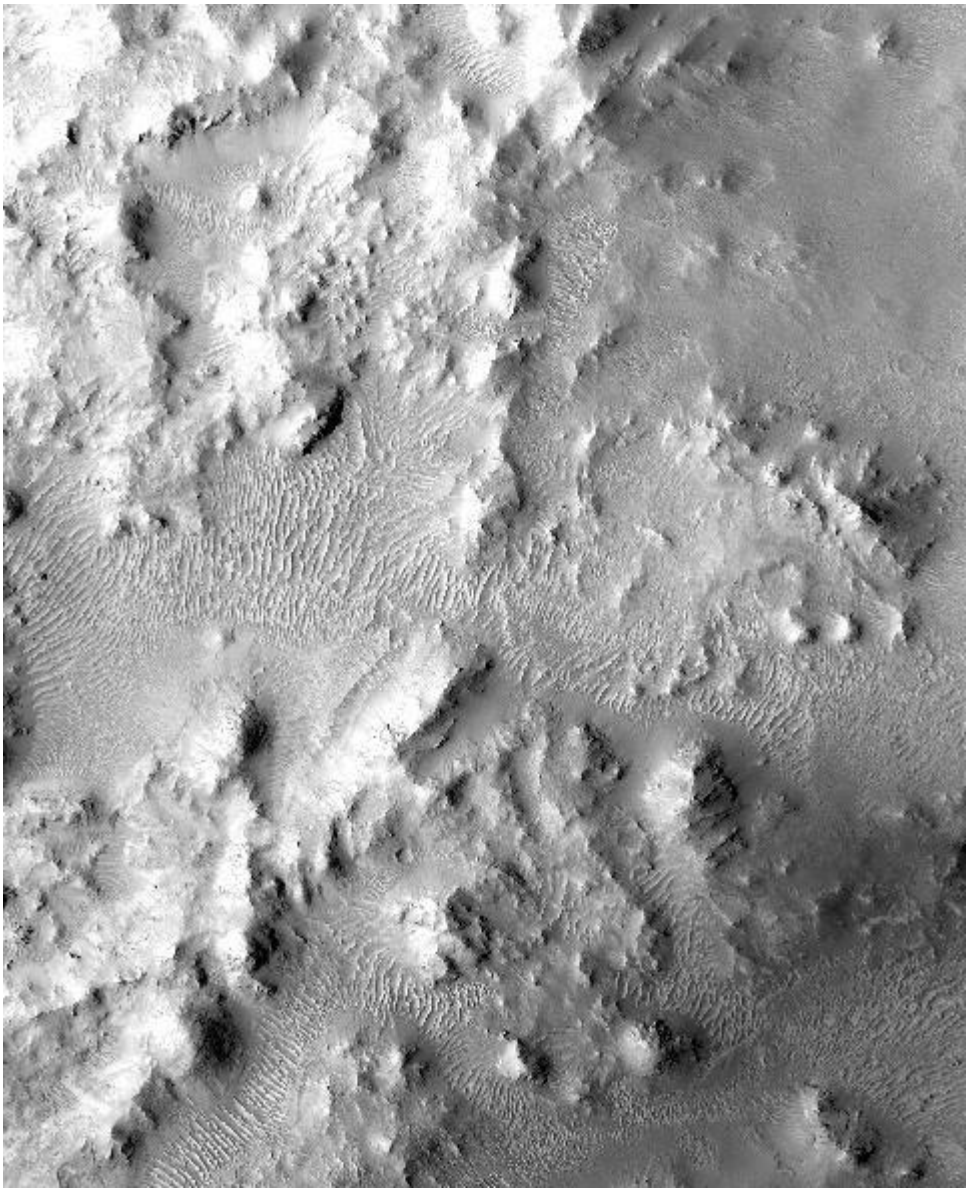

FIGURE 17. NORTH OF THE MERIDIANI FACE.

The Mars Orbital Camera overlay

This was originally done in Orme and Ness [27] to graphically show the similarities between the Crowned and Meridiani Faces. The correspondence is so close it appears like a new face with more details than either of them. The face to the right of the Crowned Face also overlays here on the dunes giving a dual face overlay. A new overlay should be much less clear in higher resolution because random chance should create more discrepancies. The a priori prediction then was that reimaging these two faces would make an overlay that was even more accurate. The null hypothesis should show that random variations increase and that the two faces are much less similar at higher resolution. Instead the similarities are more striking and this new composite face even more compelling as will be shown. Figure 18 shows this older overlay done with images from the Mars Orbital Camera.

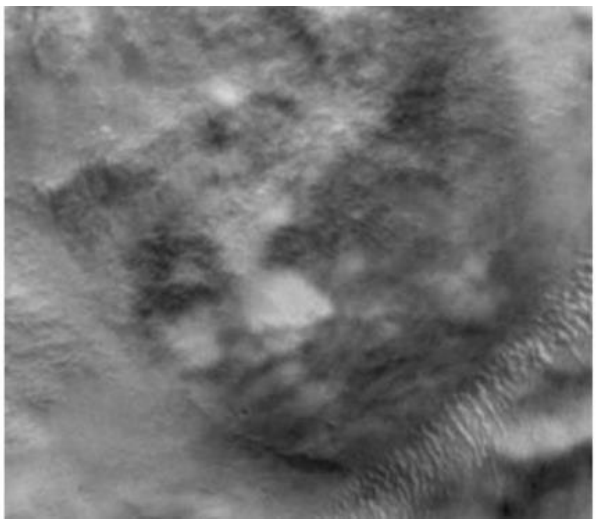

FIGURE 18. THE MOC OVERLAY.

Figure 19 shows the Crowned Face in Libya Montes, this was overlaid on Figure 1 to give the overlay in Figure 18. More details of these similarities are shown in Orme and Ness [27], Orme [19] [20].

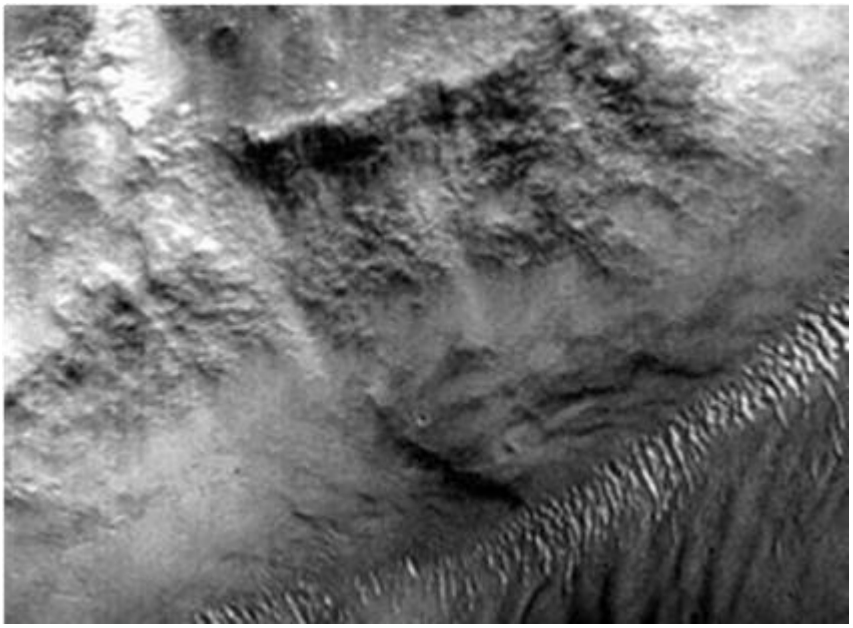

FIGURE 19. THE CROWNED FACE IN LIBYA MONTES.

Figure 20 shows an overlay of two Crowned Faces from this valley in Libya Montes, known as the King's Valley. The name is similar to the Valley of the Kings in Egypt because of the many crowned faces there. One response to the hypothesis of pareidolia is that the same face is repeated over and over in the King's Valley, also the same face was created in Meridiani Planum. Why this would have happened is unknown, as a hypothesis it may have been a leader or religious icon for example. The similarities make it less likely to occur by chance as discussed in Orme [20] in this JSE Mars Issue.

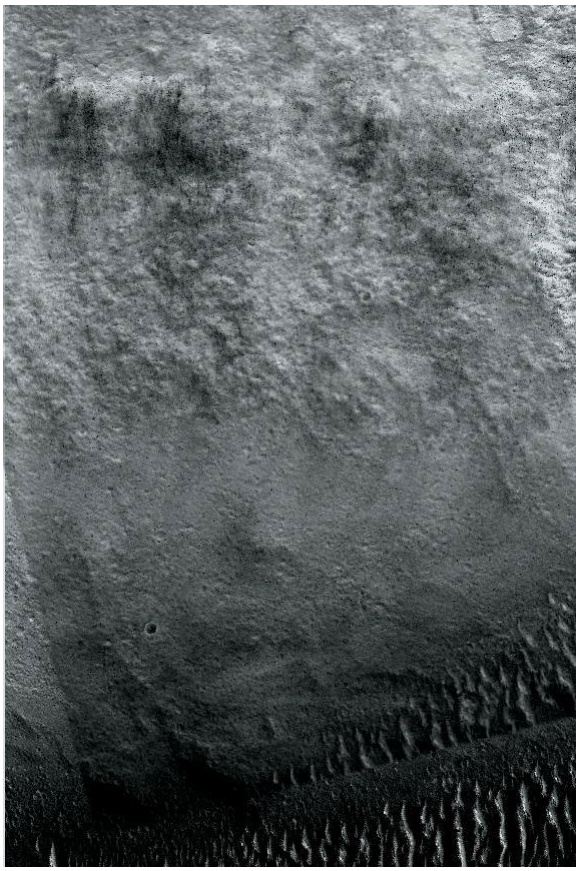

FIGURE 20. A HIRISE OVERLAY OF TWO CROWNED FACES.

The crown

The Meridiani Face crown has some indications of its shape in Figure 21, this is much clearer in the CTX context images from HiRise, used in Google Mars below.

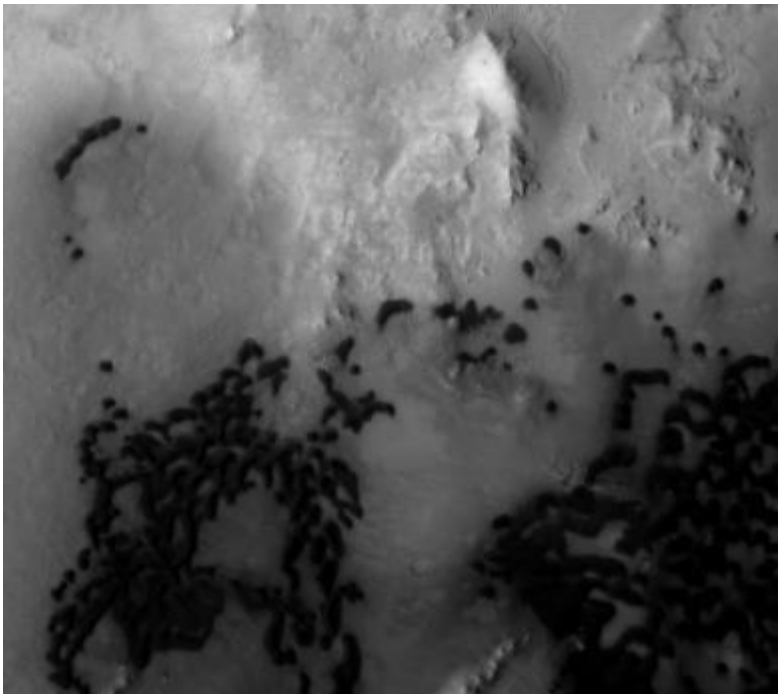

FIGURE 21. THE CROWN OF THE MERIDIANI FACE.

It appears to have a central vertical ridge as shown which corresponds to a feature on the Crowned Face crown. The eyes are at the bottom of the image. The outline of some of the crown shape is shown in Figure 22. This is a different crown to the Crowned Face but some features match up in the overlay, the original crown may have then eroded away.

FIGURE 22. AN OUTLINE OF PART OF THE CROWN.

The HiRise and CTX overlay

In Figure 23 there is an updated overlay of the Meridiani and Crowned Faces using the HiRise image. This should be compared to the overlay in Figure 20, also more of this Crowned Face overlay is shown with varying transparencies in Orme [20]. The reason for varying the transparency of one image is this allows the one underneath to gradually appear. By comparing these different transparencies then the matching features are easier to compare. The similarity is arguably obvious between the two faces in Figure 23, this was done without stretching either image but just from shrinking and rotating the Crowned Face. This image has 30% transparency with the Crowned Face. The Meridiani Face crown shape fits symmetrically with the Crowned Face; it is hard to even tell it is a composite image except for the square image borders. Both faces have unusual shapes around the mouth and the left side of the left eye. These appeared to be random, however they repeat in both faces and may have some significance.

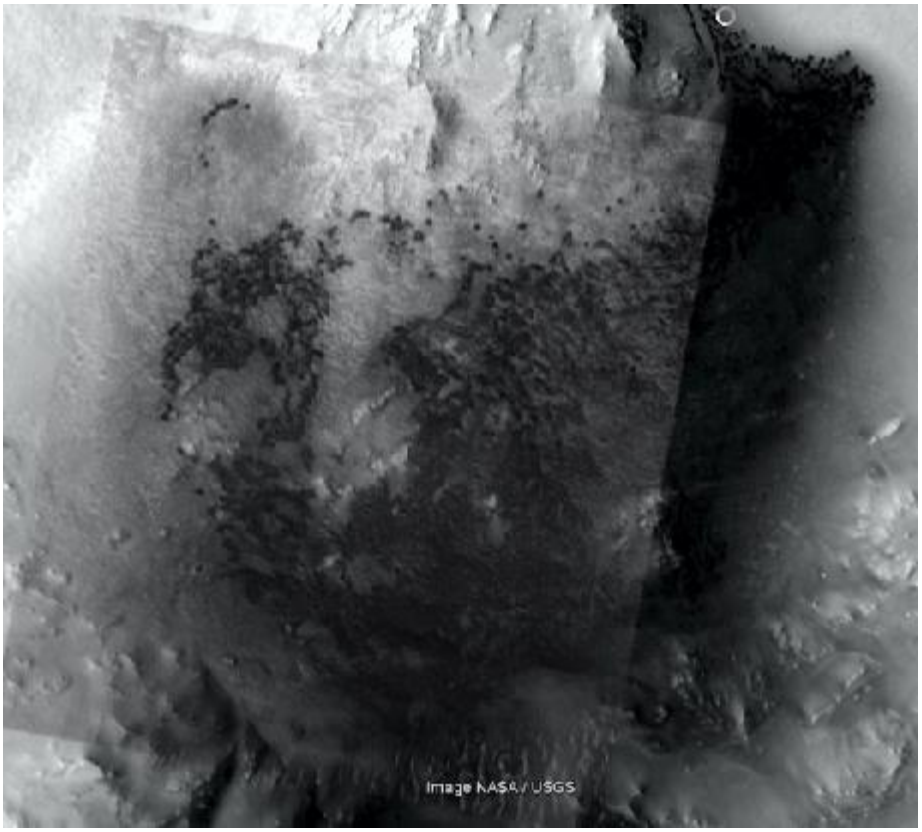

FIGURE 23. A NEW OVERLAY.

A shows a ridge on the Meridiani Face that matches a section on the Crowned Face. B matches a piece that hangs down off the left eye of the Crowned Face, it also appeared in the Mars Orbital Camera image. C shows another line that matches the edge of the Crowned Face.

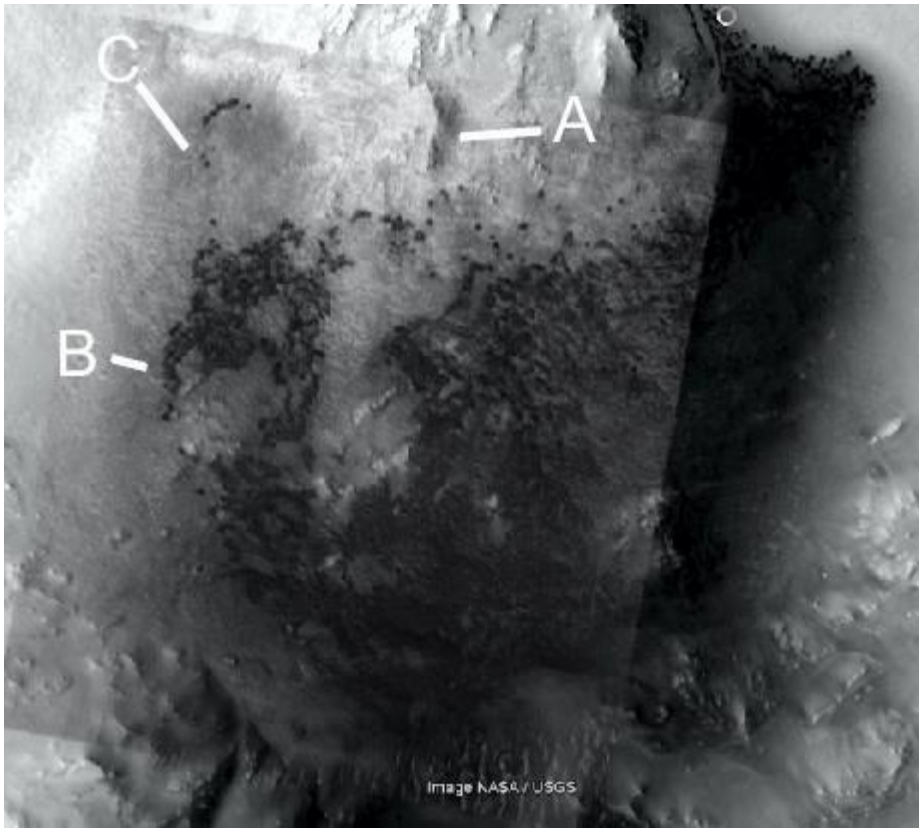

FIGURE 24. THE OVERLAY ANNOTATED.

Figure 25 has a 40% transparency with the Crowned Face. When the eyes are lined up the mouth is in the correct position. The nose is also correct as if the head is turned slightly to the side. Considering the Crowned Face is highly eroded and the dune field could have moved on the Meridiani Face the correspondence between the two is close.

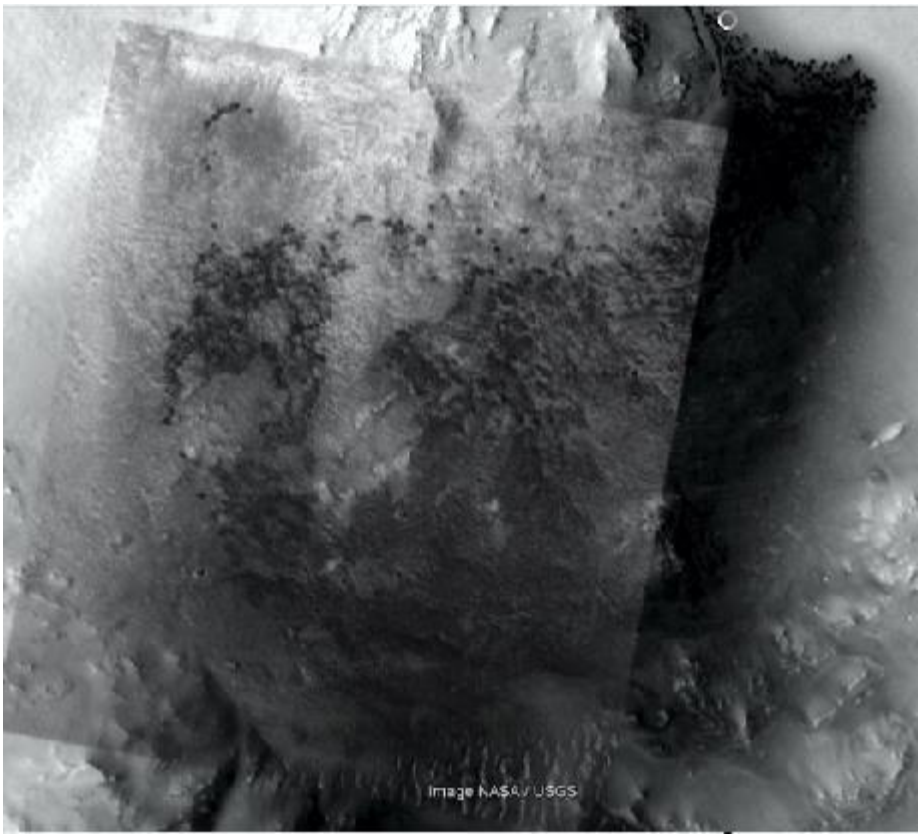

FIGURE 25. WITH 40% TRANSPARENCY.

Figure 26 has 50% transparency with the Crowned Face. The two noses merge together with a high degree of similarity. It looks more like a face with the topography and the dunes following the same shape. Random chance should arguably be showing more differences between the two. The same is occurring as in Figure 20, the similarities match as if they represent the same creature. In Orme [20] it is hypothesized that this represents low entropy in that these patterns are repeating. With the high entropy of billions of years in erosion any patterns should have been eroded away. Some low entropy patterns on Mars remain such as crater shapes and fluvial valleys. However, there are no geological processes known to consistently make highly similar faces in both dunes and valley walls.

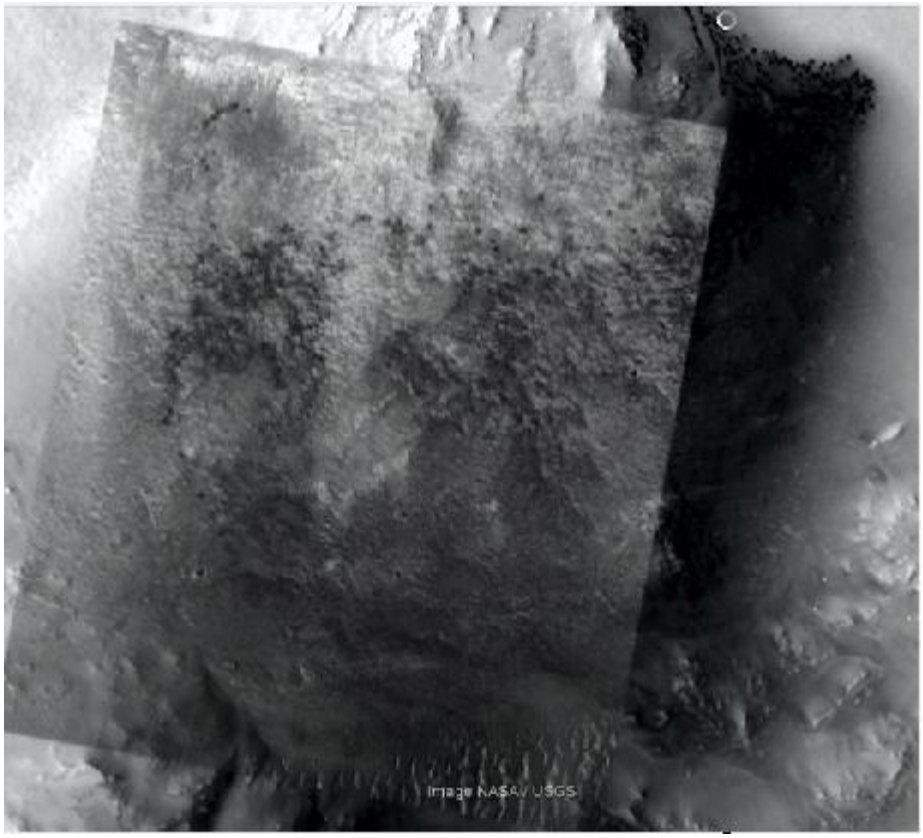

FIGURE 26. WITH 50% TRANSPARENCY.

Figure 27 has 60% transparency with the Crowned Face. This degree of correspondence would be difficult to accomplish with two random human faces. If there was such a similarity on Earth it would arguably appear to be a family relationship between the two.

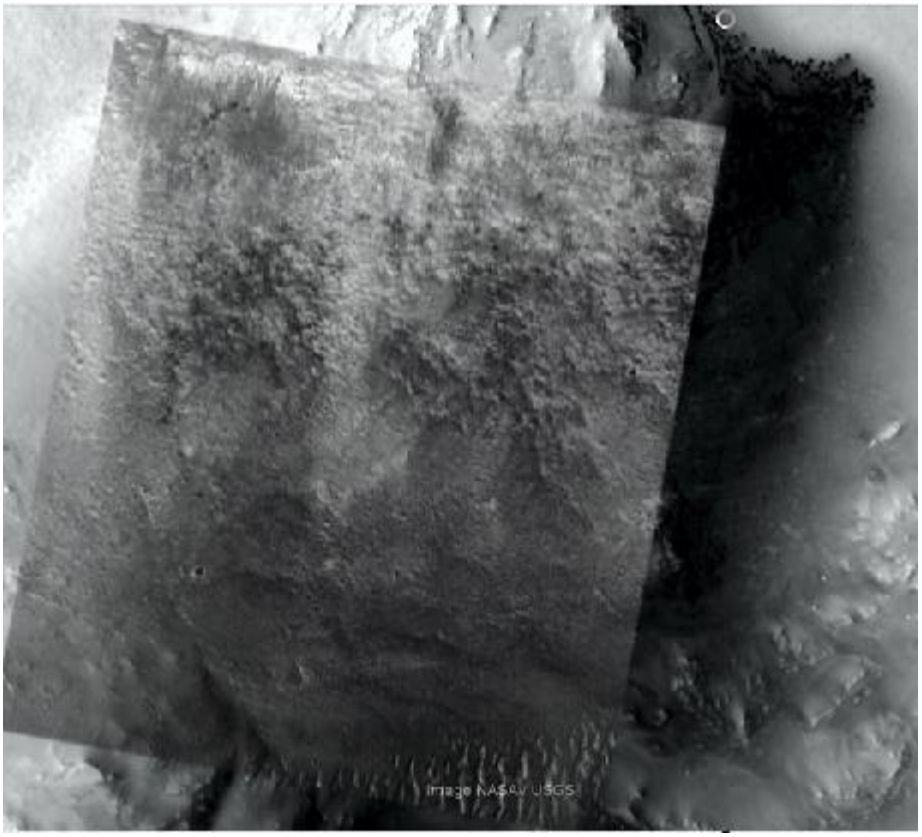

FIGURE 27. WITH 60% TRANSPARENCY.

Figure 28 has 70% transparency with the Crowned Face.

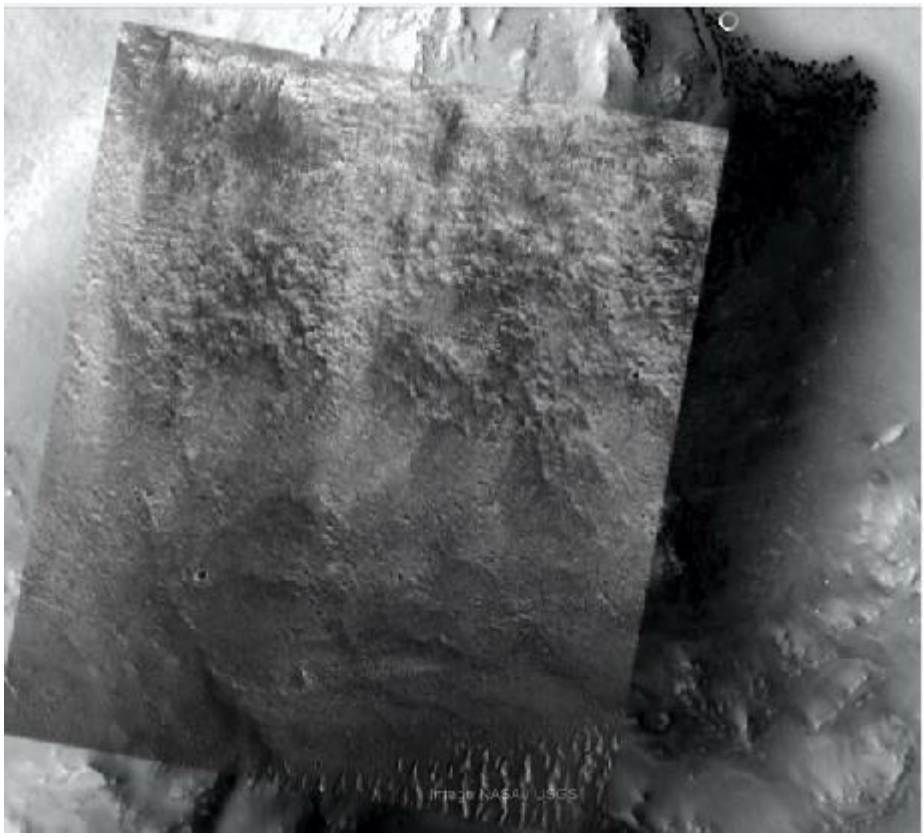

FIGURE 28. WITH 70% TRANSPARENCY.

Figure 20 shows two Crowned Faces overlaid, designated as Face 2 and Face 3. It was observed in the original overlay in Figure 18 that Face 3 is also overlaid onto the Meridiani Face, that it is also a dual face. This is shown in Orme [19], in Figure 19 the main Crowned Face has its right eye acting as the left eye to Face 3. It was then an a priori prediction that this overlay of Face 3 in Figure 18 would become much clearer in higher resolution HiRise images. The null hypothesis would be that this overlay would disappear showing it to have been random chance.

Figure 29 shows this prediction is largely confirmed, Face Three is also overlaid onto the Meridiani Face as a dual face. When the main Crowned Face is aligned as shown in Figure 23 to 28 there is a dark pupil like shape on the Meridiani Face that matches the right eye of Face Three. This is shown with a 40% transparency of the Crowned Face below.

FIGURE 29. FACE THREE OVERLAID ONTO THE MERIDIANI FACE.

In Figure 30 A shows the eyes in the Meridiani Face that correspond to Face Three, the right-hand face of the three main Crowned Faces. B shows the nose and C the mouth, in these changing transparencies they change into close matches of Face 3. It is tilted at an angle to the main face as in the King's Valley. There is a gap in the image below the right eye here just as there is in the King's Valley. It appears there to be part of another face called the Profile Crowned Face to its right, this face does not appear in Meridiani Planum however unless it eroded away.

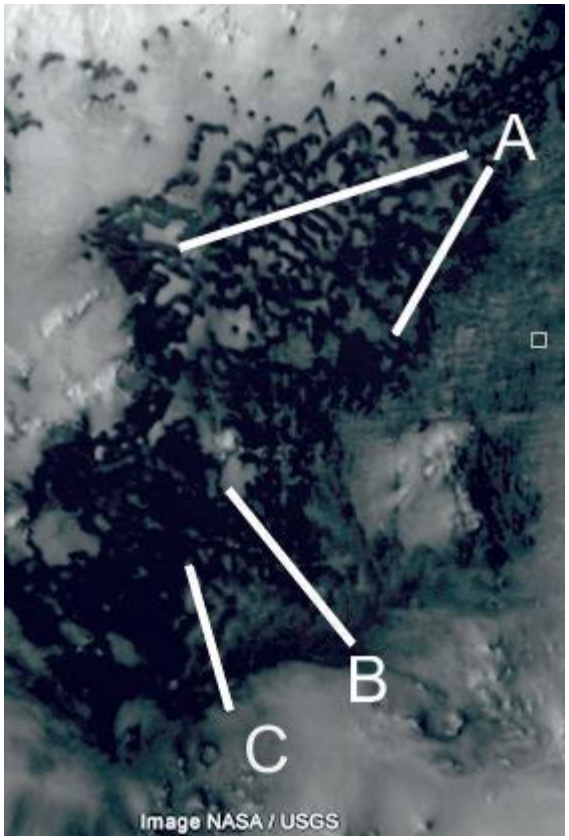

FIGURE 30. THE FACE 3 OVERLAY ANNOTATED.

This is with 60% transparency in Figure 31. Figure 32 shows the changes in A, B, and C.

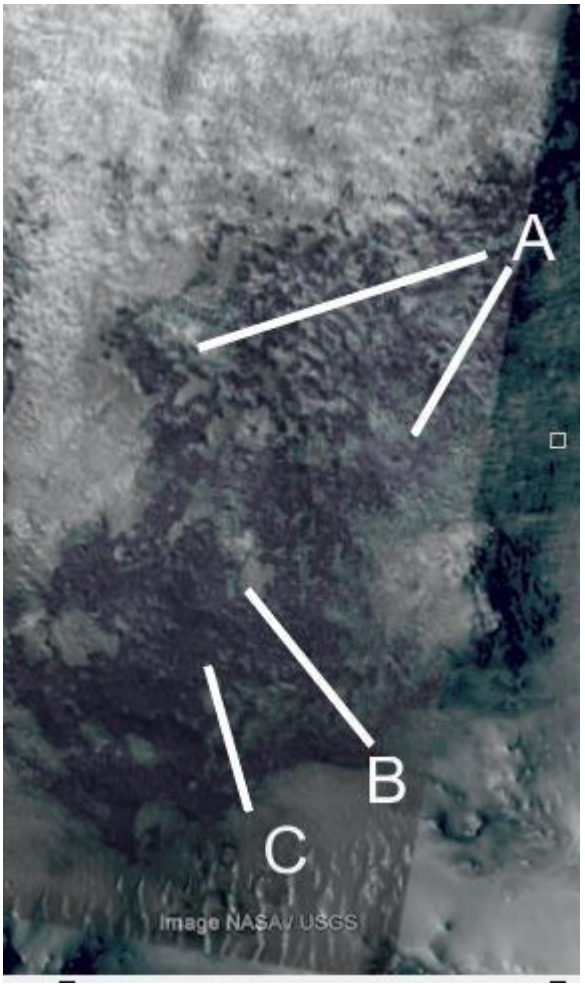

FIGURE 31. 60% TRANSPARENCY. **FIGURE 32. ANNOTATED.**

This is with 70% transparency in Figure 33, annotated in Figure 34.

FIGURE 33. 70% TRANSPARENCY.

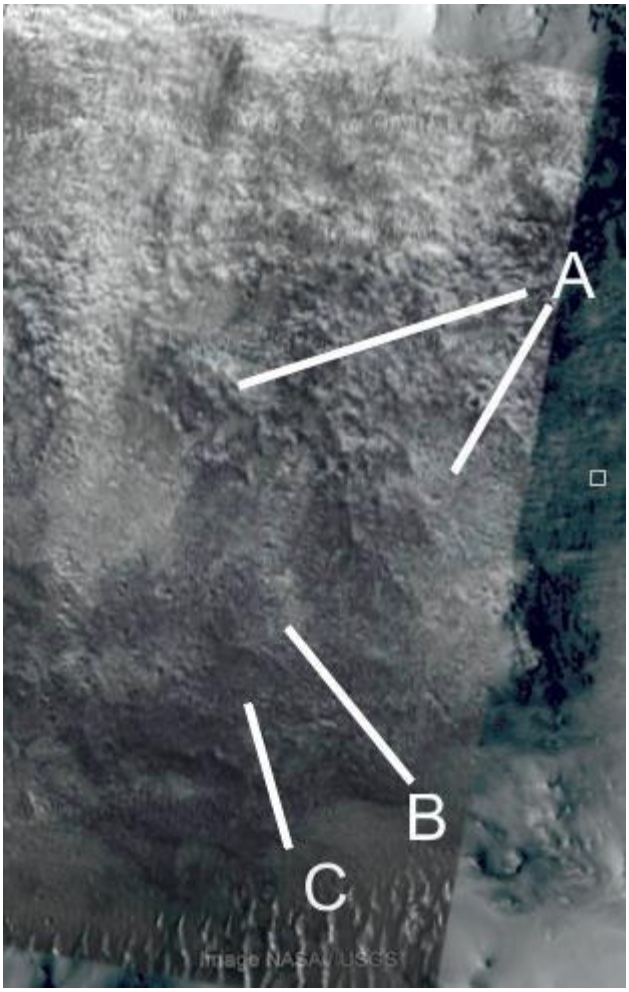

FIGURE 34. ANNOTATED.

This is with 85% transparency in Figure 35, annotated in Figure 36.

FIGURE 35. 85% TRANSPARENCY.

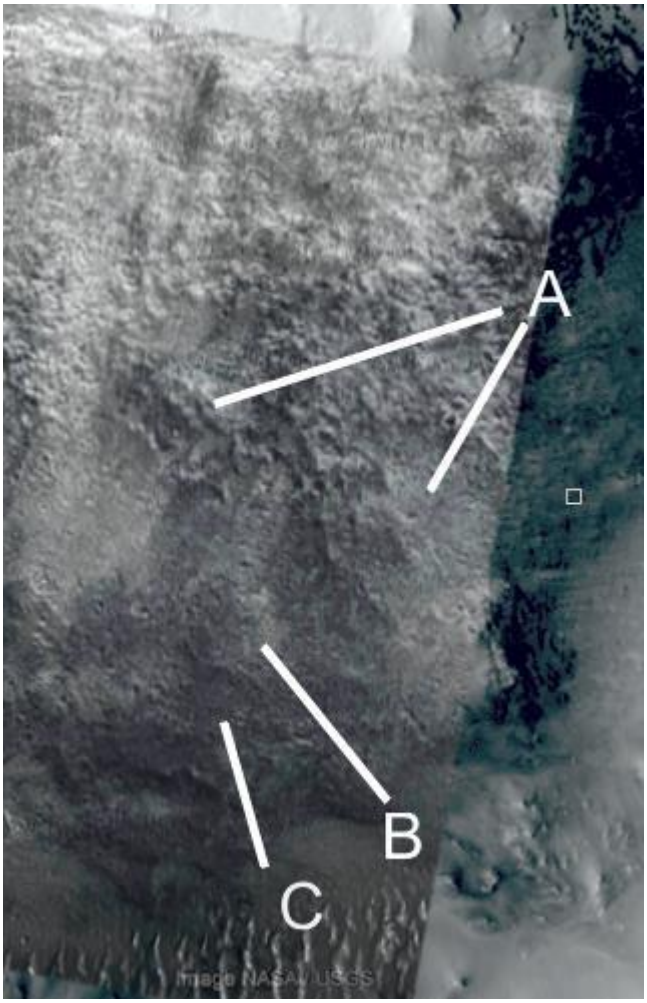

FIGURE 36. ANNOTATED.

With 90% transparency in Figure 37 Face 3 is easier to see.

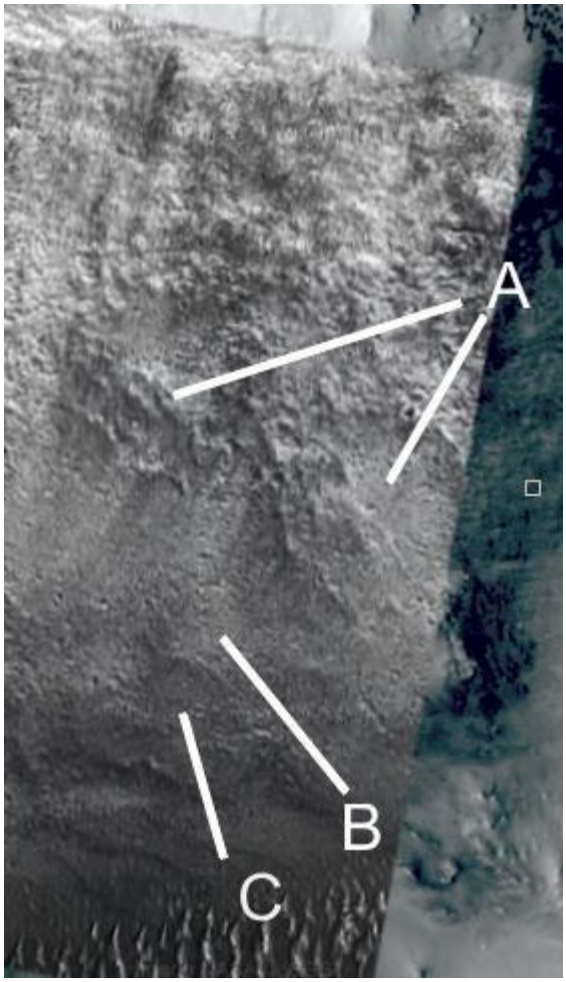

FIGURE 37. 90% TRANSPARENCY.

Conclusions

Dune fields in large craters in Meridiani Planum can migrated slowly or remain in place, this may be because of the crater rim protecting them from the wind. Other unknown processes are conjectured as also causing this dune cohesion. Many dunes in the Meridiani Face collide and cross over each other, this happens even where the topography is flat. The a priori prediction was that the Mars Orbital Camera overlay of the Crowned Face and Meridiani Face would retain the similarities between the two. This was confirmed, also these appear much more similar in the HiRise images. Also Face Three which had a slight correlation and implied a dual Meridiani Face is much clearer in these HiRise images. The null hypothesis that the dune fields comprising the Meridiani Face then has problems, also random variations between the faces in the new overlay failed to appear. This area should be reimaged at higher resolution as should the King's Valley, further a prior predictions are made that this evidence for artificiality should continue to strengthen.

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Parts of Nefertiti reimaged by HiRise

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Abstract

The Nefertiti or Profile Image was recently partially reimaged by HiRise. This paper gives a close-up of the hat and part of the front of the face. It represents a successful prediction as these features are more artificial looking, they could have looked more random under higher resolution. Also discussed are nearby paleoseas in Amazonis, Chryse, and Acidalia Planitias that imply an earlier habitable environment. Amazonis Planitia has been recommended to be investigated for ancient life signs. Cold rivers from snow melt would remain fresh, Nefertiti being on the edge of a river from Tharsis Montes could have been a former settlement.

Keywords

Nefertiti, Amazonis Planitia, Chryse Planitia, Acidalia Planitia, Crowned Face, paleosea, astrobiology.

Introduction

The Nefertiti or Profile Image formation was discovered by JP Levasseur, an SPSR researcher. It looks over a former river from Tharsis Montes, it is found on a great circle or possible former equator with other possible artifact sites. This former equator closely corresponds to a known former pole position. Cydonia, the King's Valley and the Ferns are three other possible artifact sites also on this great circle. It is important that Mars had a habitable environment in the ancient past, around 3.8Ga ago, it is not known how long after this that the habitable environment persisted. There are two proposed hypotheses here, that Mars was either terraformed by a visiting alien species, leaving signs of their visit such as Nefertiti, or that an indigenous race evolved on Mars creating artifacts like this.

Recently the HiRise orbiter took images of two parts of Nefertiti, the first image contained the mouth and nose, the second image got most of the hat shape. These HiRise images represent independent data from each other, it is improbable that each would have shown more artificial signs under higher resolution. The null hypothesis is that this formation is random, it is unlikely then that reimaging two separate parts of it would both look more artificial. Just because one HiRise image shows more artificial features does not mean the other should as well so they are independent. For example, a die might be rolled and comes up a 6 which has a 1/6 chance of occurring. If two separate dice are rolled then the odds are 1/36 as the 6s are multiplied together. It is not 1/6 as before. In the same way if one HiRise image appeared more artificial at 1/100 against chance then the two would give 1/10,000 against chance. Assessing this exact improbability is difficult, however. The nose is much more artificial looking with the nose tip being quite sharp. The lips and jaw are also much clearer. Many parts of the hat are more anomalous looking.

A HiRise and CTX composite image

Figure 2 shows a composite image; the main part is a CTX image F09_039500_1653. The HiRise image ESP_034792_1655 just managed to catch the mouth and nose of this formation. The HiRise image ESP_045935_1660 includes most of the hat and neck.

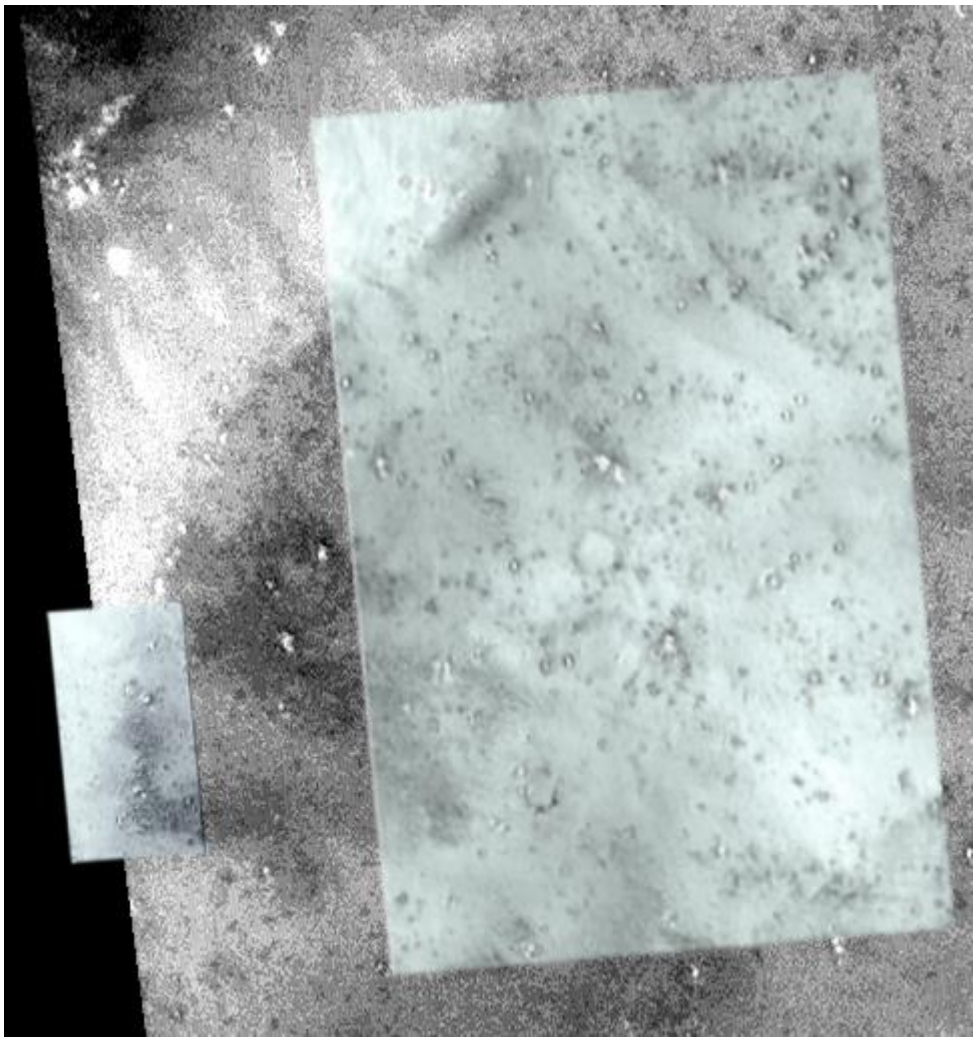


Figure 2. A composite image.

In Figure 3 A shows the nose is much sharper and fully formed, this could have become a more random natural shape so this was unlikely to happen by chance. B shows the chin and jaw line is much sharper and less natural looking. C could be a crater or an ornamental part of the hat. D shows an unusual ridge forming part of the hat, it is not like a natural dune. E shows the top edge of the hat and a faint ellipse shape. This is seen in some crowns in the King's Valley. F shows how the neck is clearer in the CTX image, there is a suggestion of a ponytail at the back of the head or perhaps it is part of the neck or hat.

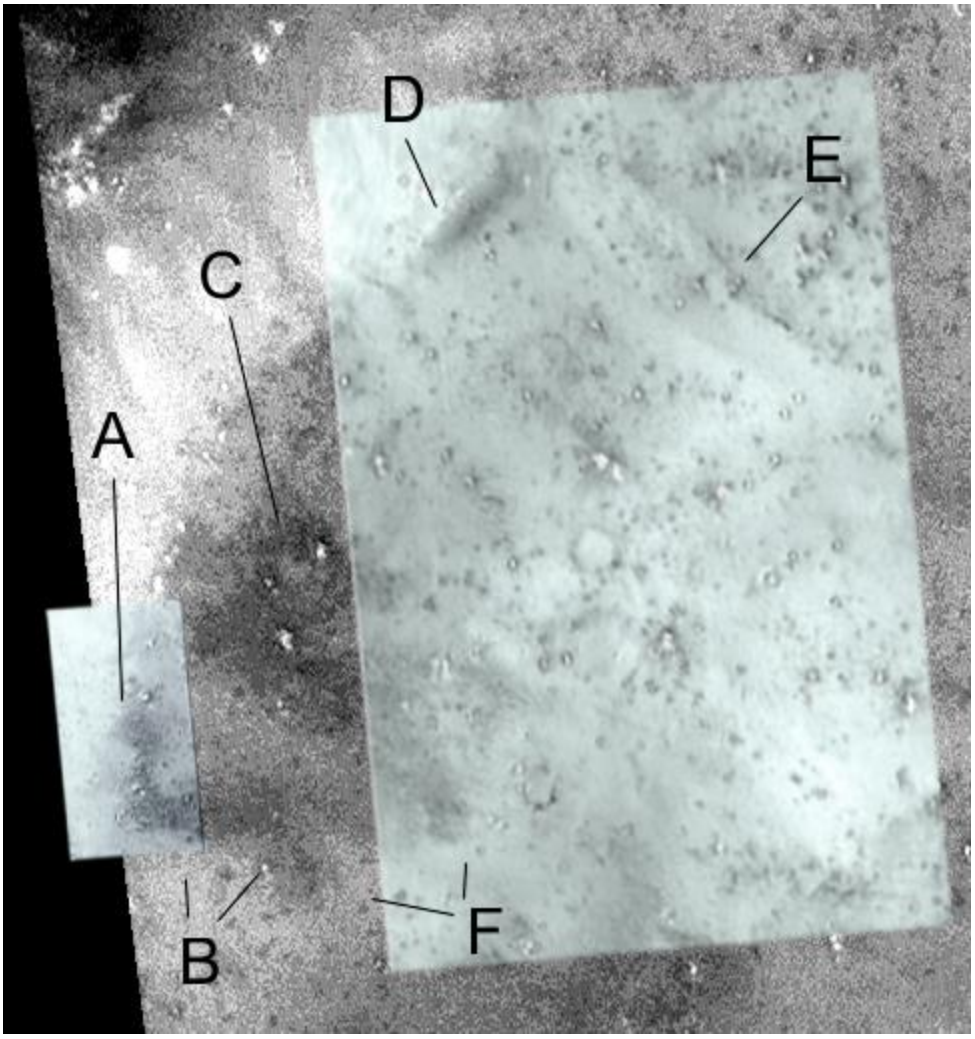


Figure 3. The composite image annotated.

Figure 4 shows the top of the hat; the elliptical shape on its top is more visible. Some of the crowns in the King's Valley have this elliptical top, like a 3D effect.

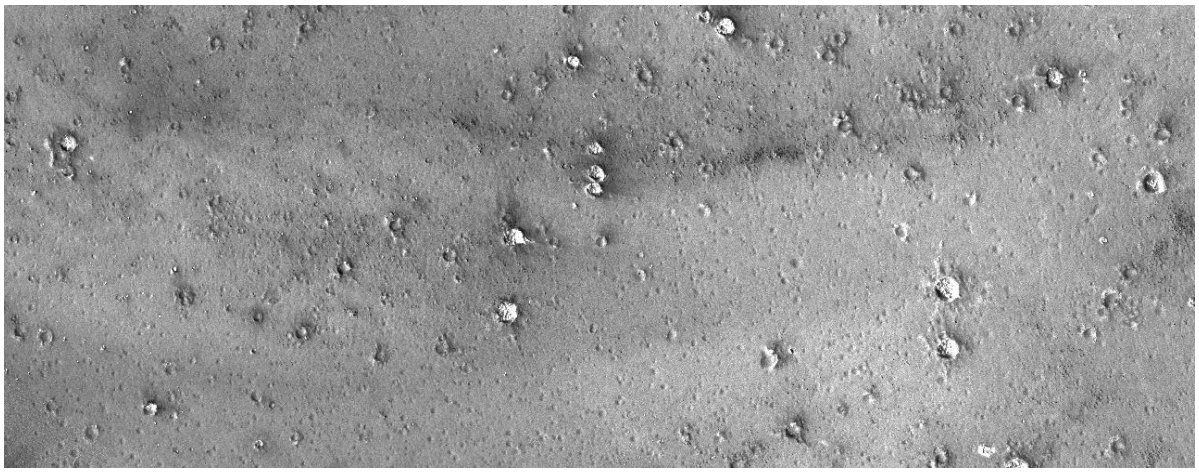


Figure 4. The elliptical top of the hat.

Figure 5 shows some of the dark material next to Nefertiti, it may be an artificial construct which would explain why it lasted so long. It seems ingrained into the ground and is not just dark soil on the surface.

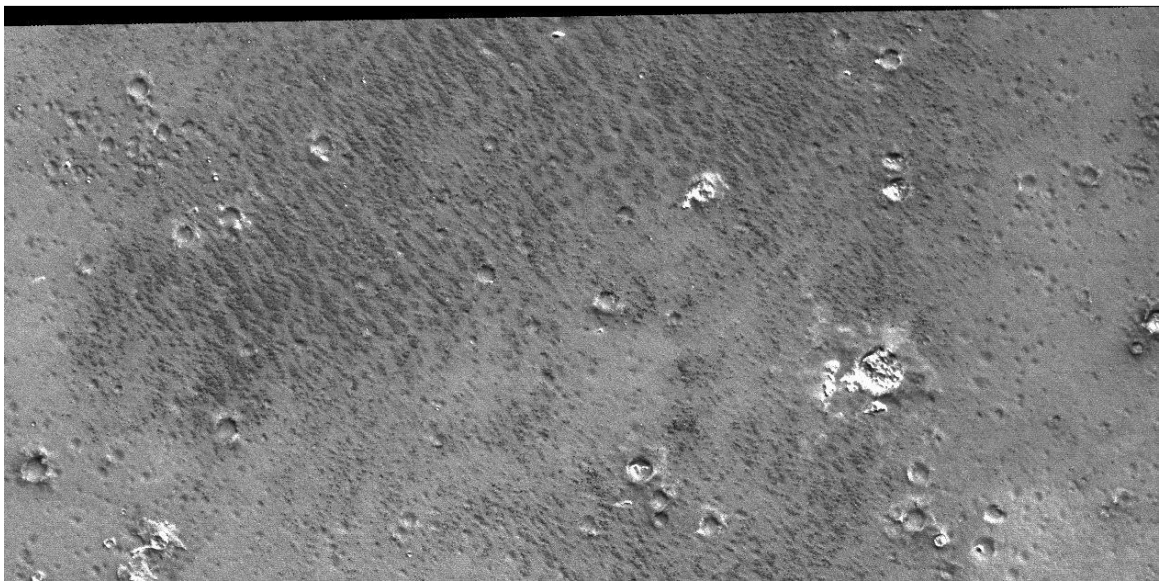


Figure 5. Dark soil near Nefertiti.

Figure 6 shows the ridge on the front of the hat in the image. It appears to have some symmetry and it is not like a standard dune.

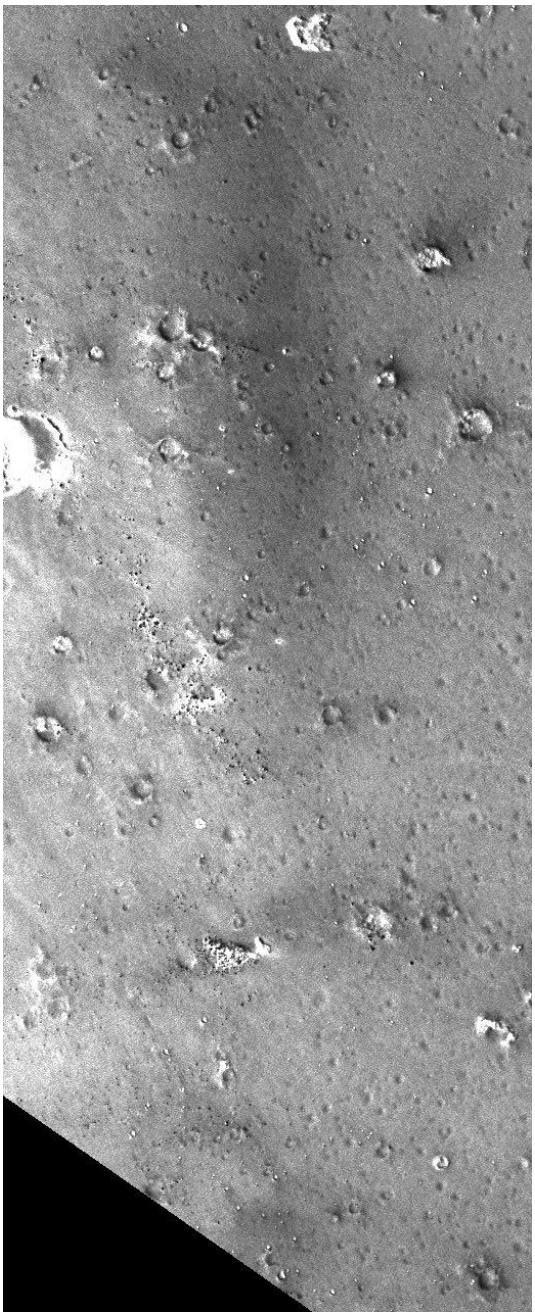


Figure 6. The front of the hat.

In Figure 7 the elliptical part of the hat top and the front ridge are shown from the HiRise image. The front ridge throws a substantial shadow making it easier to be seen from above.

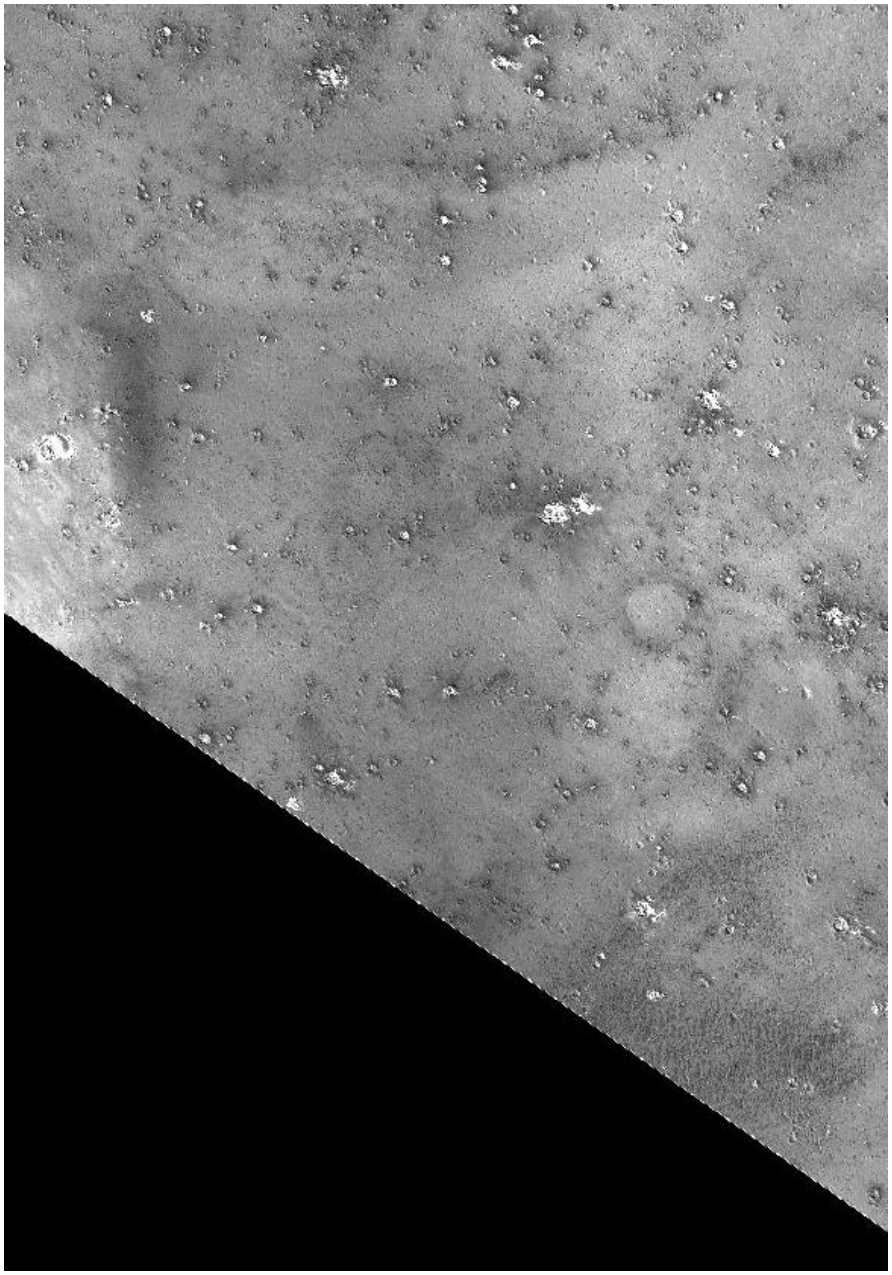


Figure 7. The hat in HiRise.

Figure 8 shows a close-up of the front ridge on the hat. It appears to be very steep around the edges with no sand indicating a dune.

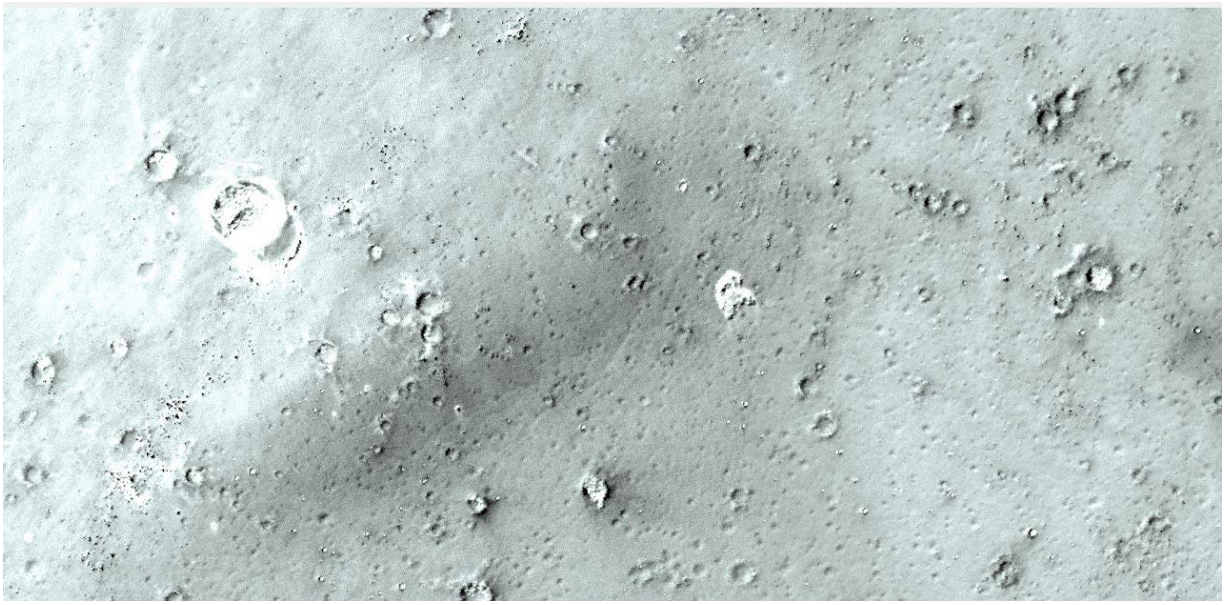


Figure 8. The front of the hat in HiRise.

Figure 9 shows Nefertiti looking over the gulley in the middle top of the image. It may have been visible from the opposing bank; the face may be on an angle so as to be visible from the other river bank.

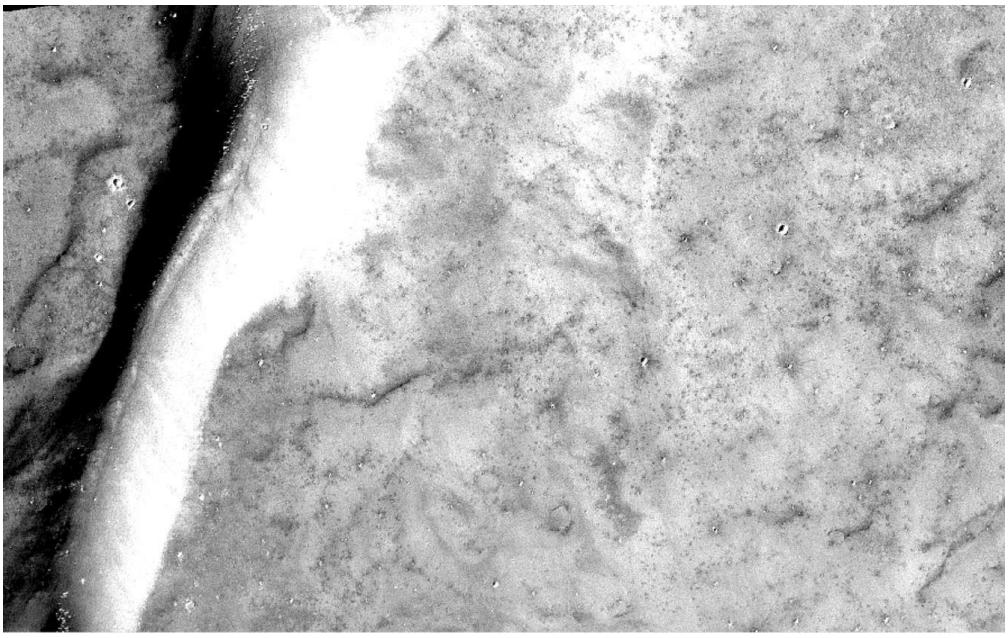


Figure 9. Nefertiti looking to the left.

Figure 10 shows Nefertiti in F09_039147_1939 without the HiRise overlays. As can be seen the HiRise sections make it more artificial looking. The nose here is much less clear and the chin is less sharp. By random chance then a reimaging of this face could easily have shown it to be distorted, for example the nose shape might have become so non-face like as to refute this artificiality hypothesis. Reimaging these formations then can falsify the artificiality hypothesis.

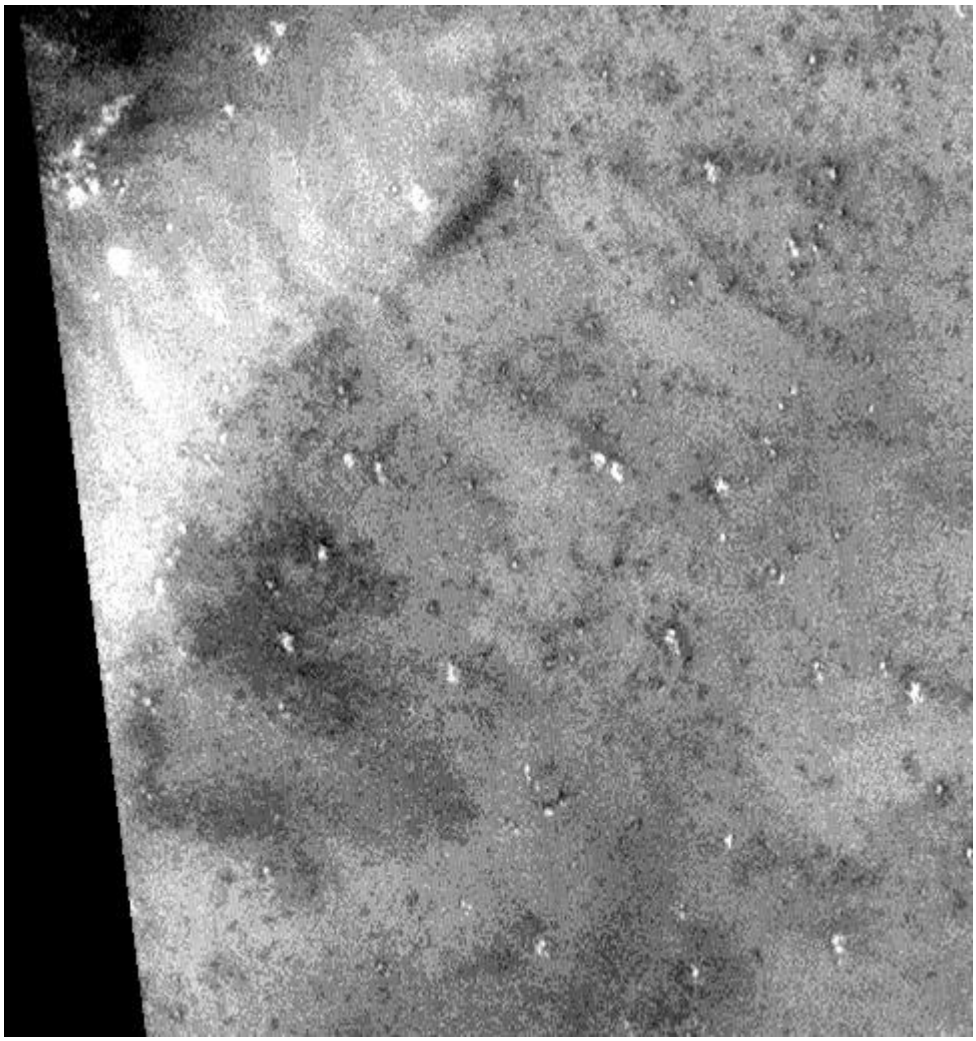
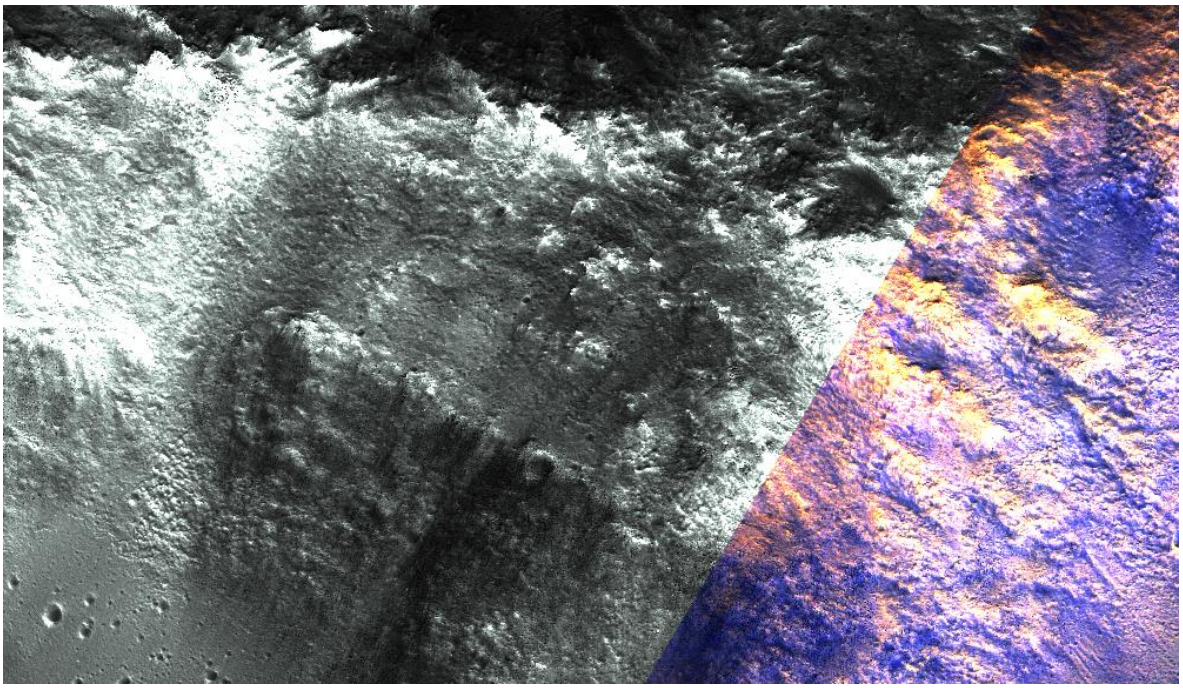
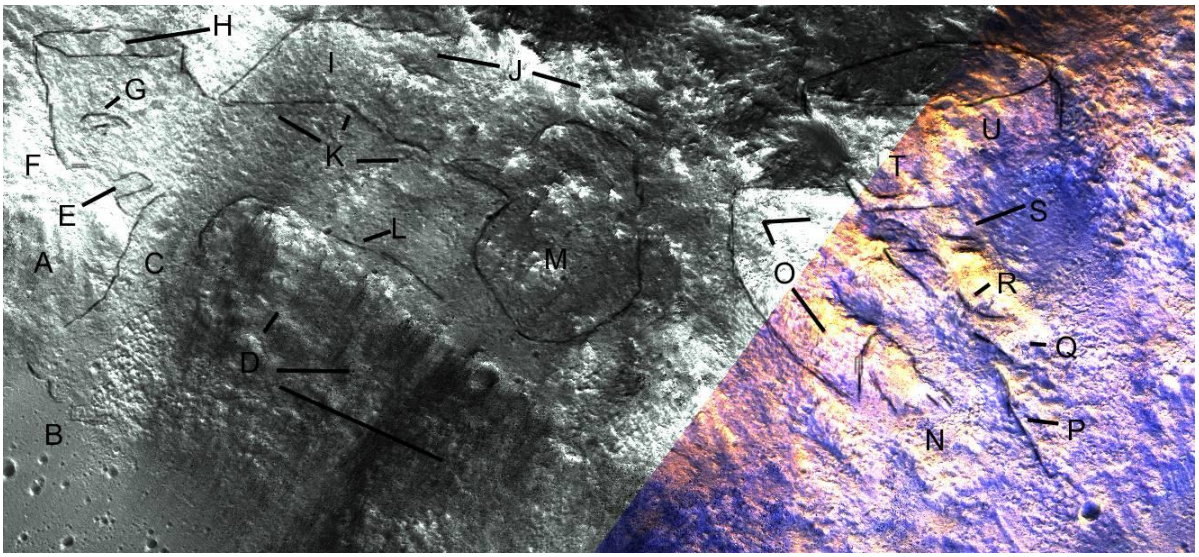


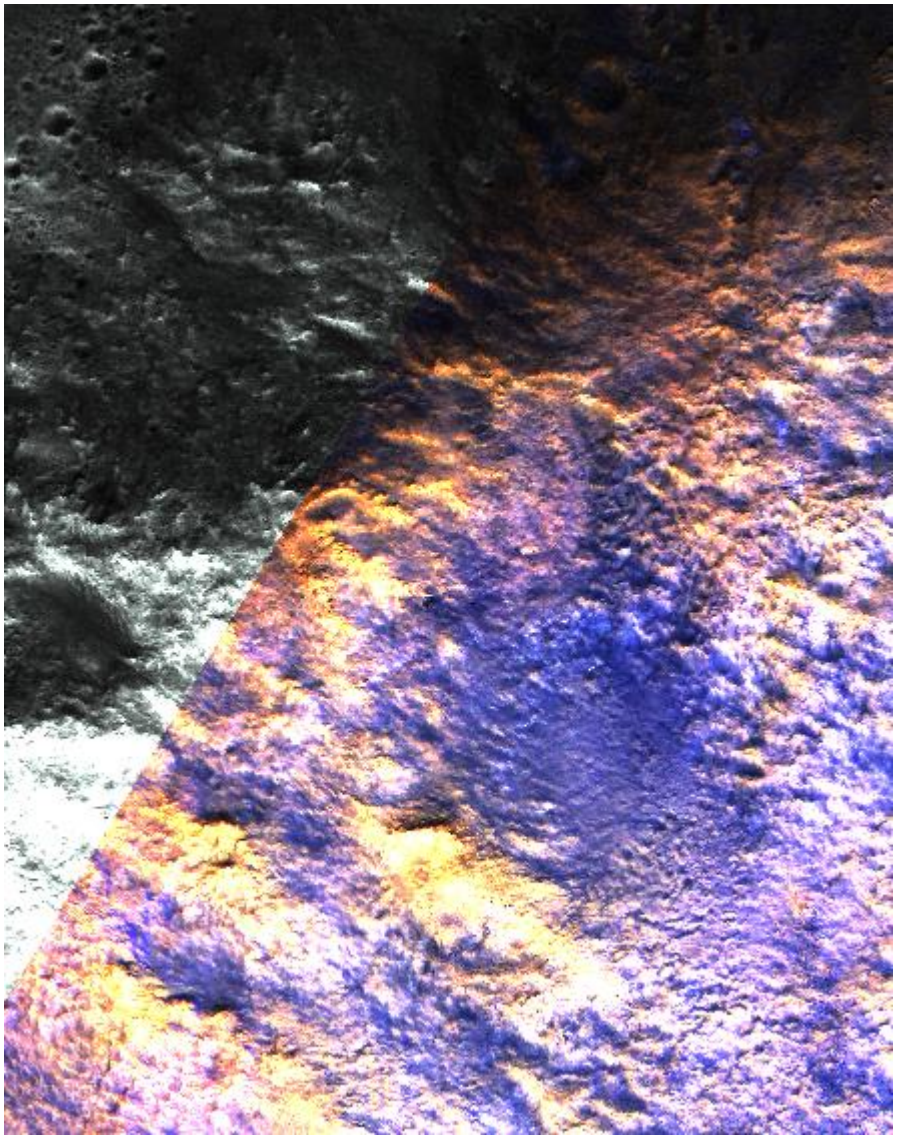
Figure 10. Nefertiti is less clear in a CTX image.

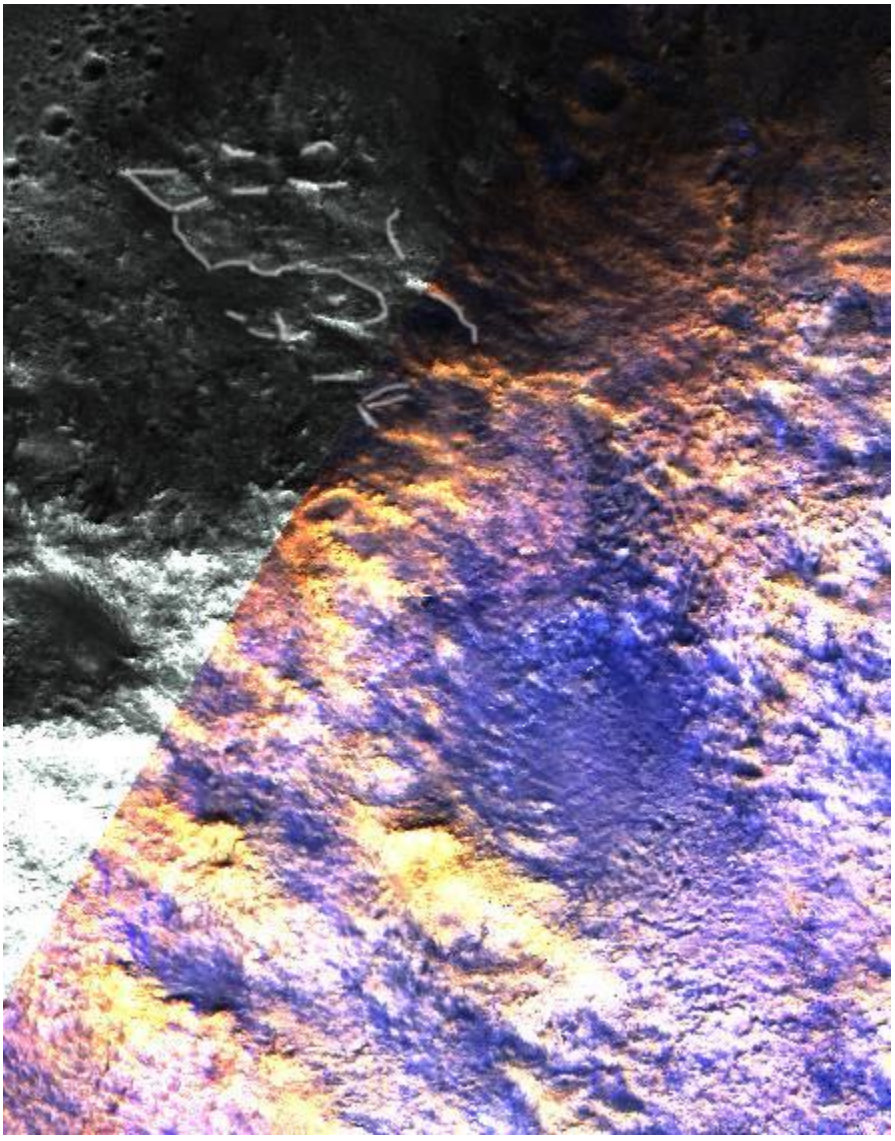
Figure 11 shows it in B08_012560_1661, not as clearly. A HiRise image is needed of the whole face. The hypothesis is that reimaging will show even more artificial features.

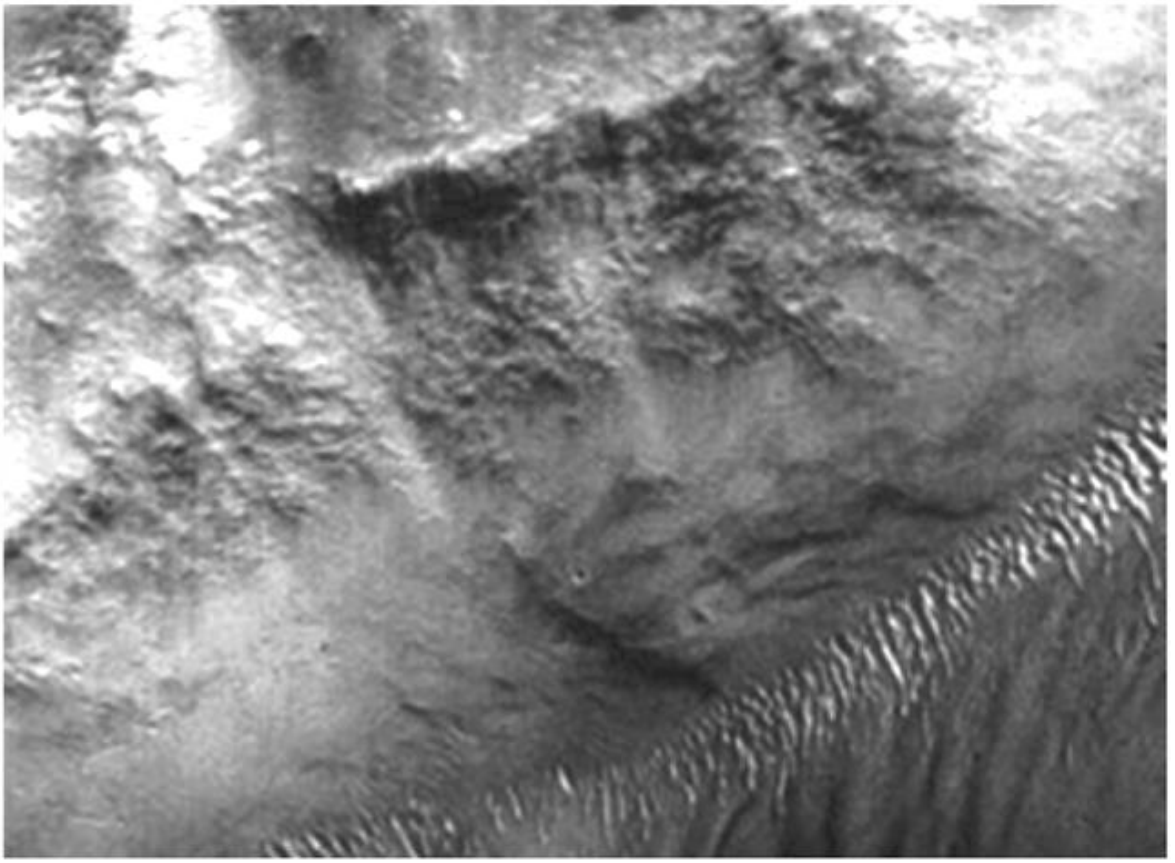
Comparisons with other Martian faces

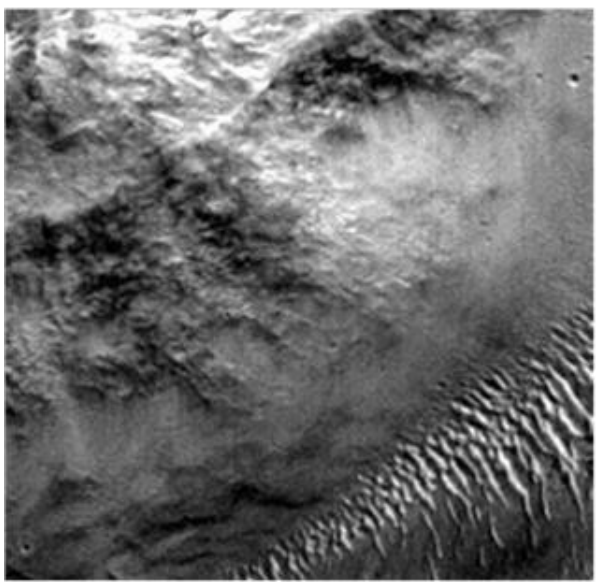


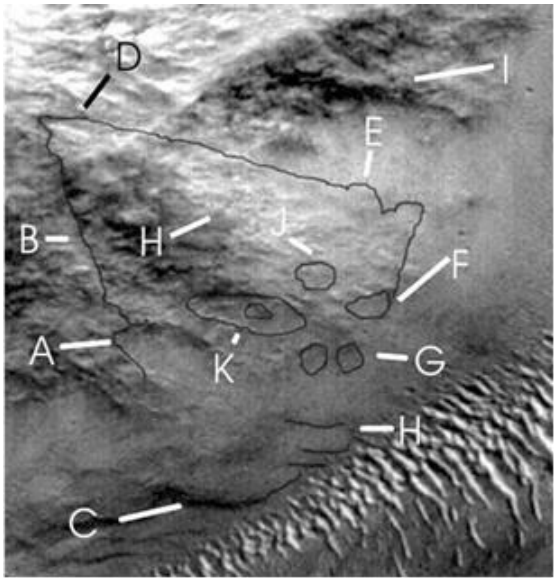








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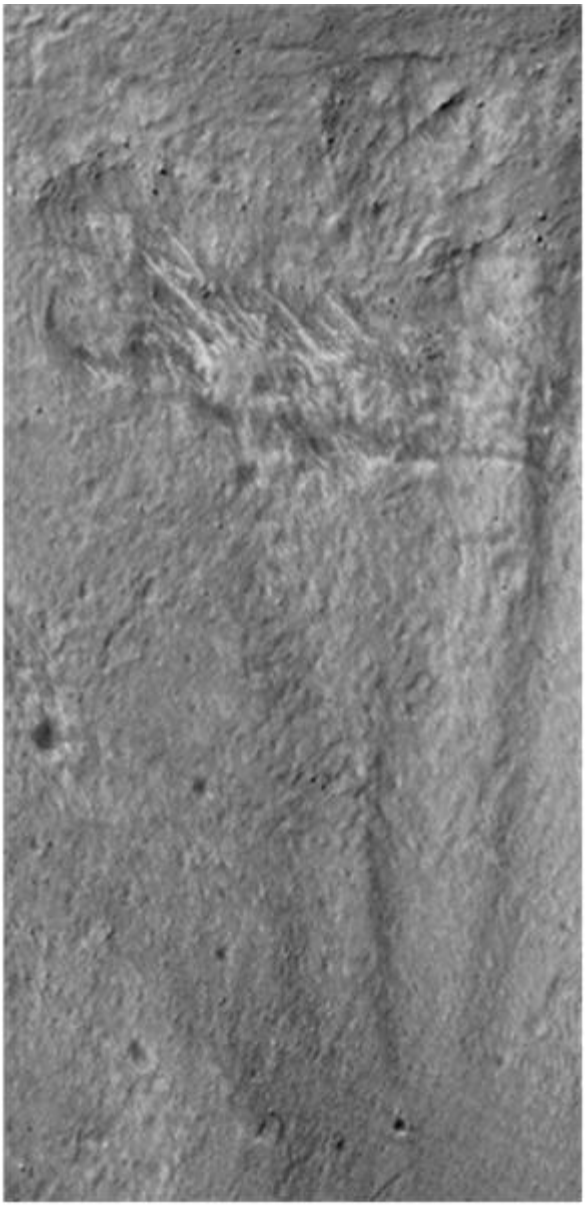

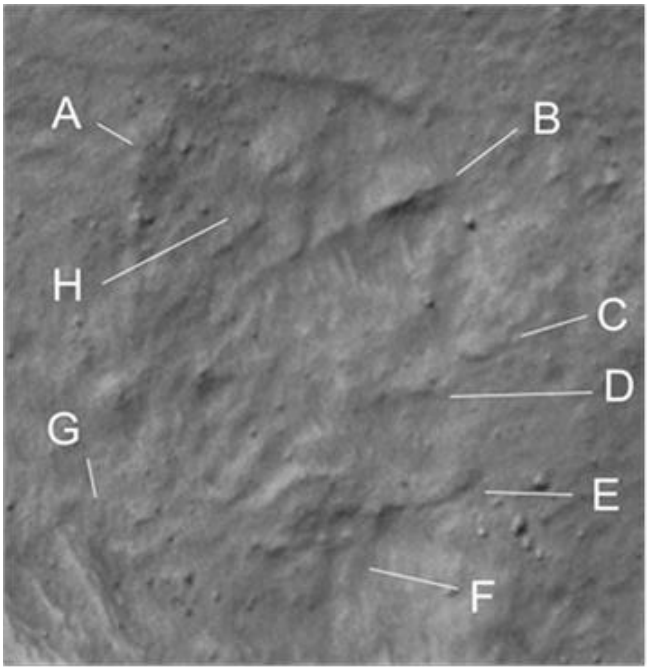
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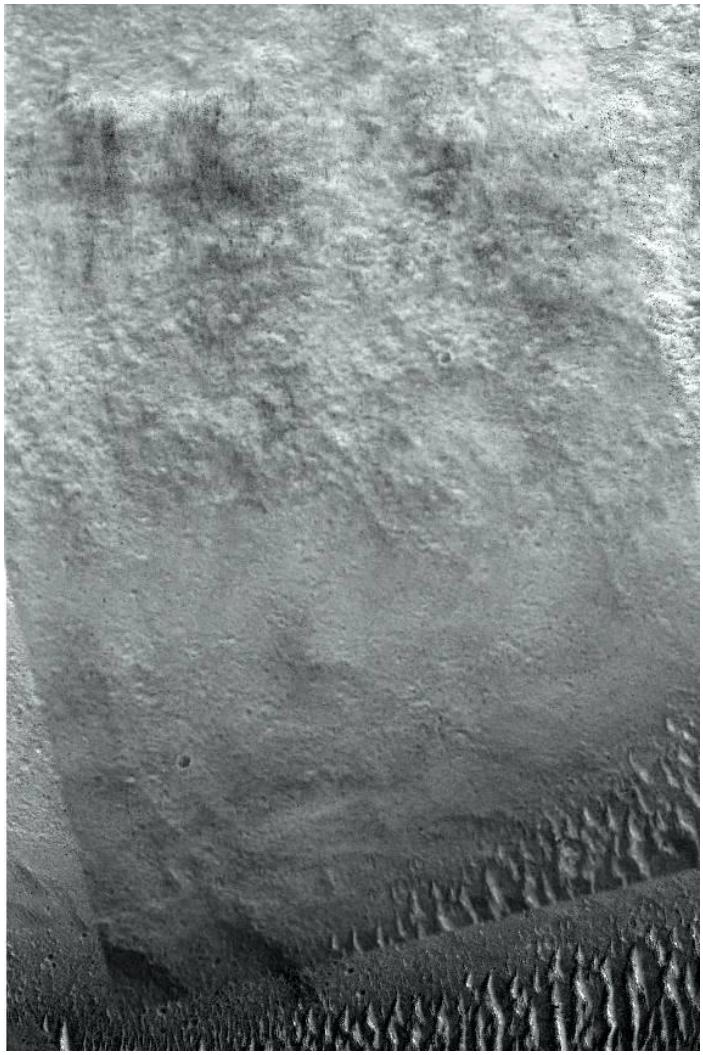
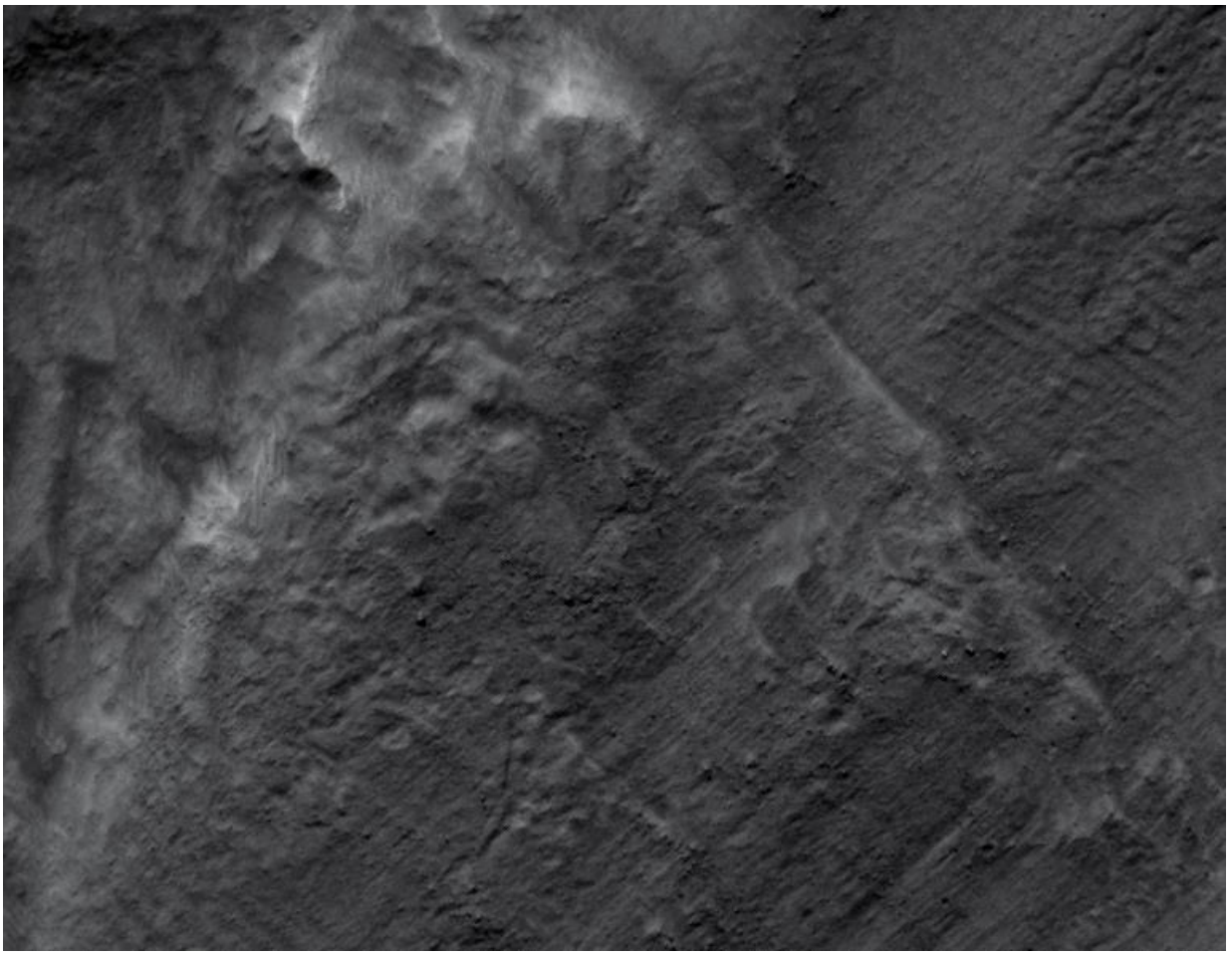
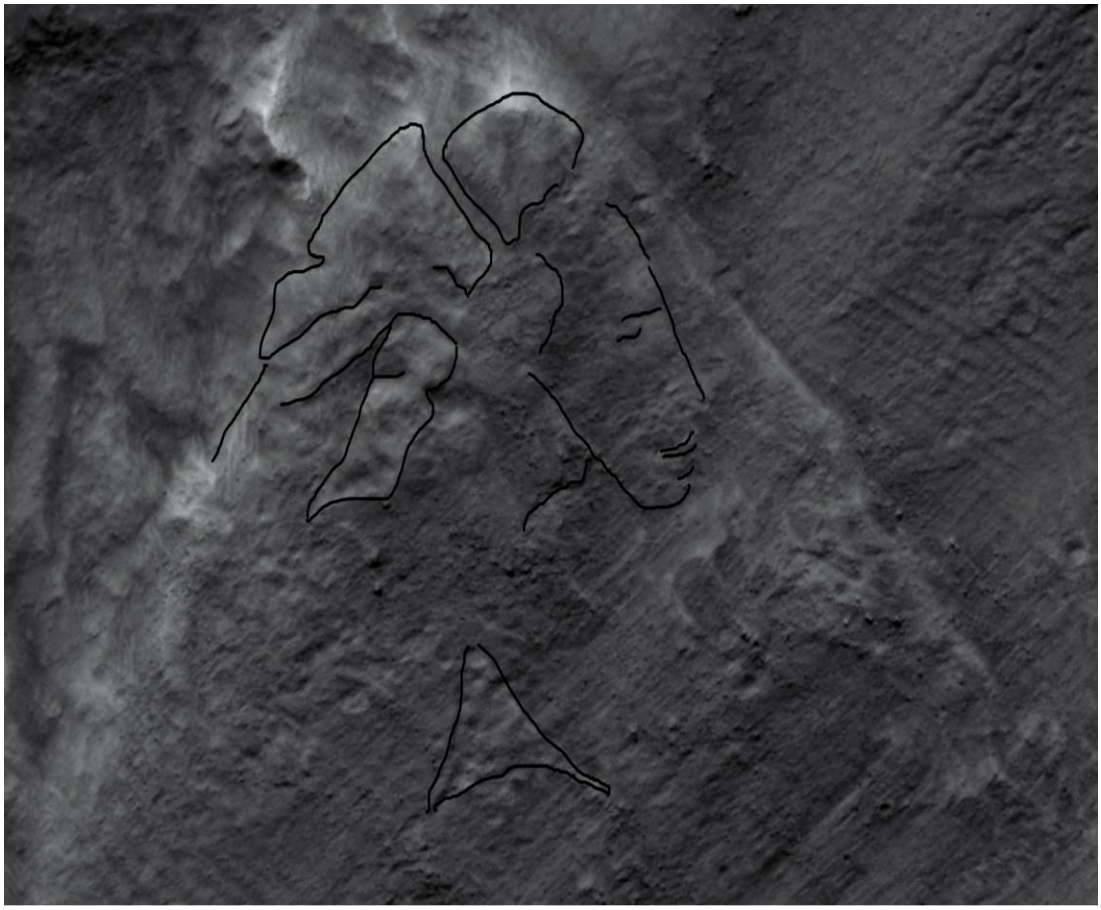






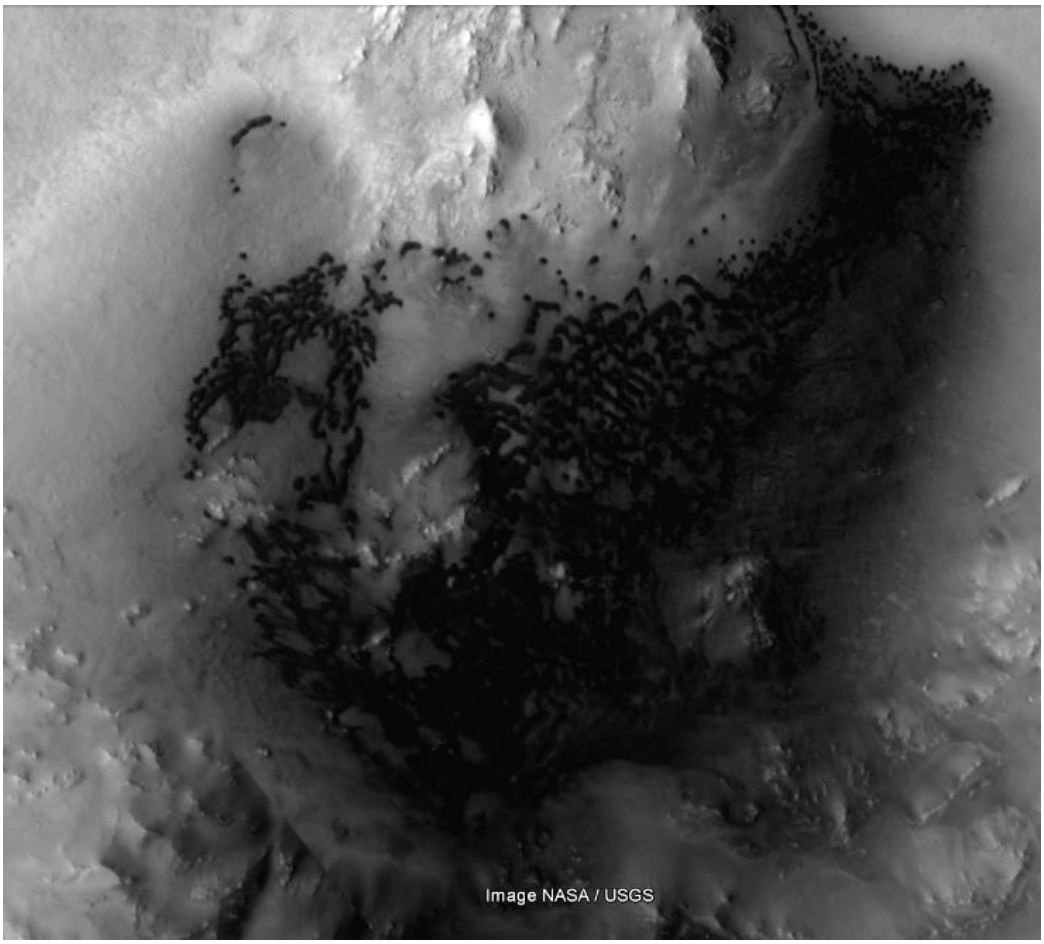
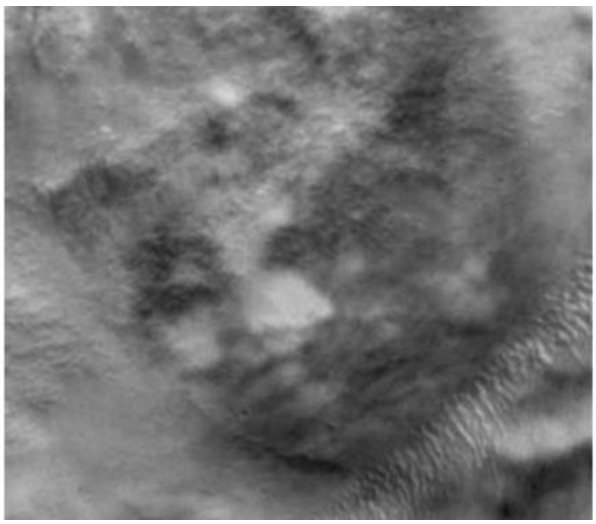
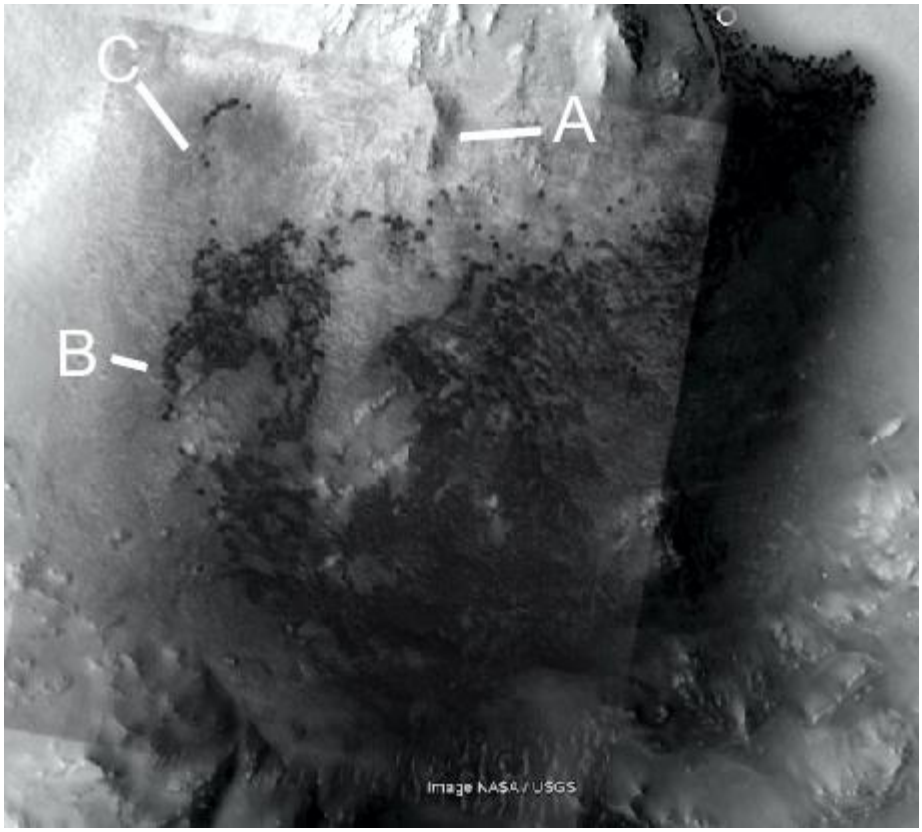


Image NASA / USGS





Discussion

Oehler and Allen (2013) offer support for an ancient ocean on Mars. Giant polygons in Chryse and Acidalia Planitia, near the Nefertiti formation, suggests they formed in a large paleosea. This was likely to have existed in the later Hesperian to early Amazonian. They are like terrestrial polygons of a similar scale and are associated with expected fine-grained sediments. Late Hesperian outflow floods may have formed these polygons; this is consistent with the hypothesis in Orme and Ness (2011) of the Argyre impact melting the South Pole creating floodwaters down Valles Marineris. These would have then flooded into Lunae Planum, Chryse and Acidalia Planitia creating the paleosea. These polygons are restricted in elevation supporting an inference of a body of water controlling their formation. Similar polygons are found in Utopia Planitia, these may have been formed as the North Pole also melted from antipodal volcanism creating Elysium Mons from the Argyre impact. The existence of a paleosea near the Nefertiti formation supports the artificiality hypothesis, for this paleosea to last up to 1Ga it implies a thicker atmosphere, weather conditions, all of which are consistent with a habitable environment.

Fuller and Head (2002) discuss nearby Amazonis Planitia, this has extremely smooth topography reminiscent of abyssal plains in Earth's oceans. They also discovered a 1300km diameter Noachian impact basin in northwest Amazonis Planitia, also a Late Hesperian lava flow originating from Olympus Mons. The existence of this impact crater so close to the pole might support the terraforming hypothesis in Orme and Ness (2011). It was proposed the Argyre impact may have been directed at the South Pole to melt the ice and sublimate the atmosphere creating paleoseas and a habitable environment. This impact may have happened by chance and by creating volcanoes on the poles caused them to melt. They may also have been directed deliberately to create rifts and volcanoes on the poles to warm Mars and seed it with life, these are the two hypotheses discussed here.

This impact would have been very shallow so the shearing forces of the shock wave would have created rift valleys such as Valles Marineris and volcanoes such as Tharsis Montes and Elysium Mons on the opposite side of Mars. It was also suggested by Orme and Ness (2011) that Isidis Crater could also have been directed at the opposite pole forming Elysium Mons, alternatively that the Isidis impact was unrelated. There are then two proposed hypotheses, the first being that aliens visited Mars and terraformed it with meteor impacts to seed it with life. The second is that this Argyre impact accidentally melted the pole creating a 1Ga paleosea that allowed indigenous life to evolve on Mars. This impact crater in Amazonis Planitia could have been part of this terraforming process creating Olympus Mons, Fuller and Head (2002) suggest the impact happened before the Olympus Mons aureole formed and so it may have cause the rise of this volcano.

According to the authors this has astrobiological implications, these lava flows may have occurred as recently as 24 million years ago. Heat from Olympus Mons may then have allowed some of this paleosea to survive until more recent times, the longer this warm environment lasted the more likely sentient life could have evolved and survived on Mars. The Nefertiti formation is found on the edge of a river coming from Tharsis Montes, if this river was providing water then it is further associated with possible astrobiological evidence.

Watters et al. (2007) examine the nearby Medusae Fossae Formation, there are indications of remnant equatorial ice comparable to the south pole layered deposits. This lends support for Orme and Ness (2011) where the pole moved along the MFF perhaps pausing at Lucus Planum. Figure 1 shows an elliptical crater pointing to Apollonius Mons as a small red circle, this is like the proposed terraforming hypothesis by Orme and Ness (2011) where the Argyre impact was directed towards melting the South Pole. If this area contains remnant polar ice then this impact may also have been directed to warm and melt the polar ice at the time. Amazonis Planitia in Figure 1 is where Fuller and Head (2002) propose another impact crater is found possibly creating Olympus Mons. If Isidis Crater formed the Elysium Highlands, particularly Elysium Mons, then there is a pattern of oblique impacts following the pole as it moved or having been aimed at it from several directions. It was proposed in Orme and Ness (2011) that Hellas Crater could also have been directed at a pole position corresponding to a great circle of possible Martian artifacts.

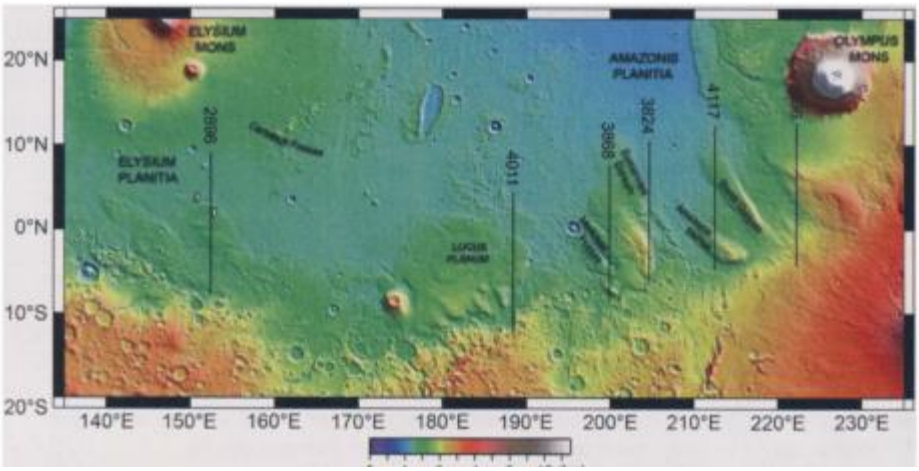


Figure 1. The Medusae Fossae Formation (MFF).

Schurmeier et al. (2014) discuss mid latitude ice-rich areas on Mars as targets to search for life. As former poles these would be associated with paleoseas in Lunae Planum, Chryse Planitia, Acidalia Planitia, Utopia Planitia, Elysium Planitia, and Amazonis Planitia per Orme and Ness (2011). Schurmeier et al. (2014) classify sites according to polygons, large cracks, cliffs, and large boulders as having been associated with ice-rich deposits. They find that Amazonis Planitia is a good landing site to search for life, this is close to the King's Valley and the Nefertiti formation. Instead of a warmer Mars the authors propose a cold and wet environment, this can be associated with the moving pole maintaining low temperatures as proposed by Orme and Ness (2011). Schurmeier et al. (2014) discuss how a runoff from snow precipitation does not extract much salt from the soil with weathering on Earth. They assess the Martian air pressure at the time to have been 2-3 bars, also that sulfur was an important atmospheric constituent. This would likely have come from volcanic outgassing. The river on which the Nefertiti formation is found then was likely to have been relatively fresh. They further propose that water was stable in liquid form on the surface for extended periods, also that cold rivers were flowing into one or more paleoseas.

They propose this hydrological cycle would have been active with a dense atmosphere, also that high temperatures are needed to trigger evaporation and snowfall. This is consistent with Orme and Ness (2011) where the higher temperatures would be provided by Olympus Mons, Elysium Mons, and Tharsis Montes while the colder climate would be controlled by the moving poles. Schurmeier et al. (2014) discuss how mean surface temperatures of 245–255 K might have allowed for 15–35% of the planetary water inventory to remain liquid. They also discuss how the loss of atmosphere caused temperatures to fall below the lower limit for water to remain liquid. This would have caused the northern ocean to freeze on its surface, evaporation being an inefficient process in brines. In Orme and Ness (2011) it was proposed that as the volcanoes cooled the atmosphere began to freeze at the poles, this would have caused the oceans to freeze and eventually sublimate to the poles as well. The process then would be similar, except that the loss of atmosphere was caused by the cooling of the Martian volcanoes that caused this original terraforming.
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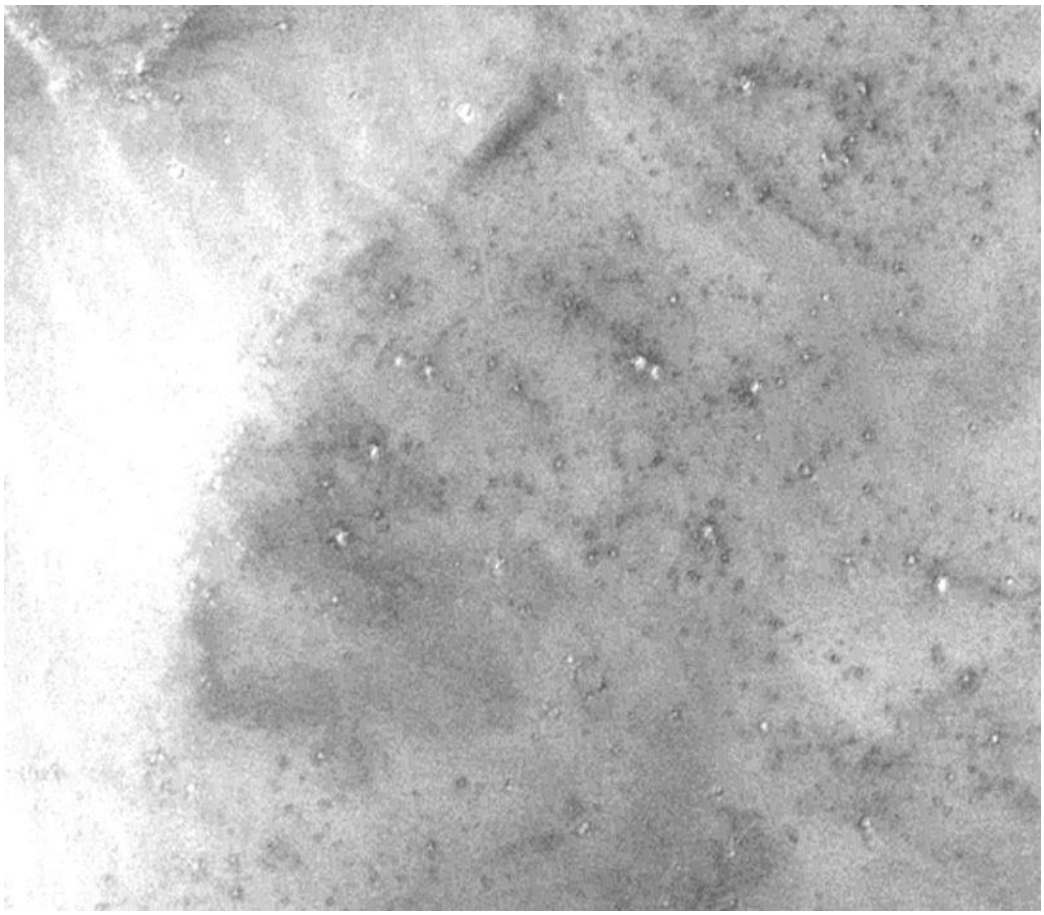

Figure 11. Nefertiti in a second HiRise image.

Figure 12 shows the HiRise section of the chin and mouth at 100% of its size. The nose is a dark mark on the ground not associated with physical shapes like ridges or rocks. There appear to be more craters and pits forming this shape.

Figure 12. The chin and mouth in HiRise.

There are also some symmetrical shapes associated with Nefertiti, these are presented here as predictions for when it is reimaged further. Figure 13 shows a dark area under it like part of a torso. This is in F093500_1653.

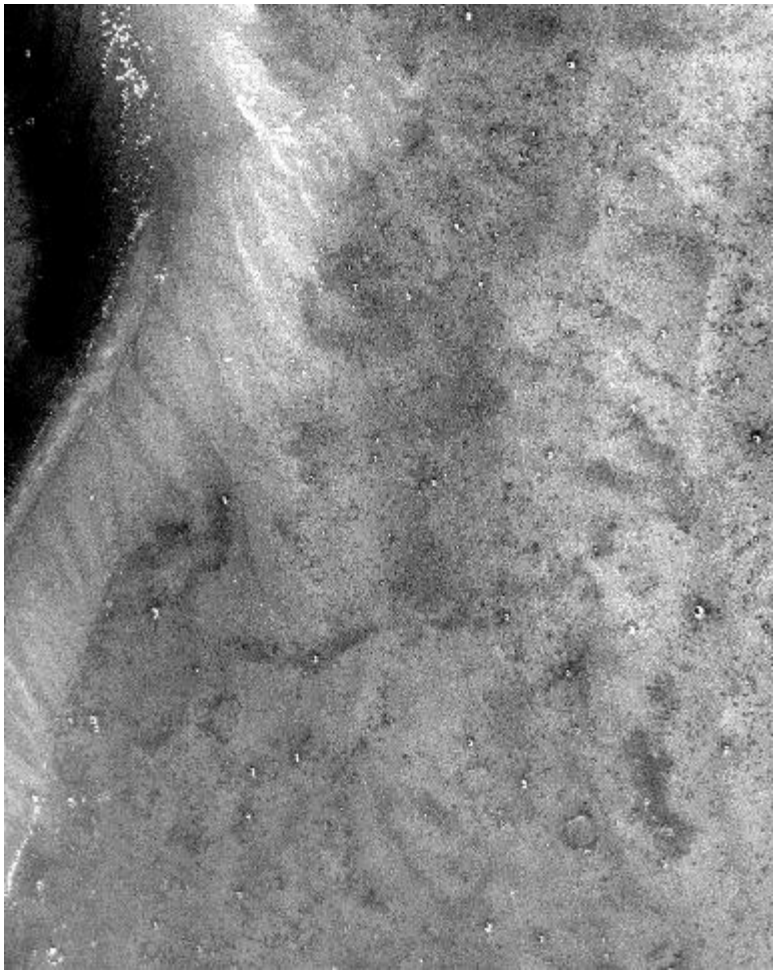

Figure 13. A symmetrical shape under Nefertiti.

This is outlined below, part looks like shoulders and a back. The other section below it is also roughly symmetrical and may be part of clothing. It represents an important prediction because Nefertiti's claim to artificiality rests largely on its appearance. Connected symmtrical structures are much less likely to occur by chance, if they are later shown to connect to the face motif this would be strong evidence for artificiality. These additional shapes, if they are confirmed or appear more artificial in a future HiRise image, would further falsify the null hypothesis that these are random natural formations.

Figure 14. The shape outlined.

It is also seen in P20_008657_1654 below in Figure 15. The shape is there in different images so it is less likely to be from distortion introduced by the imaging process.

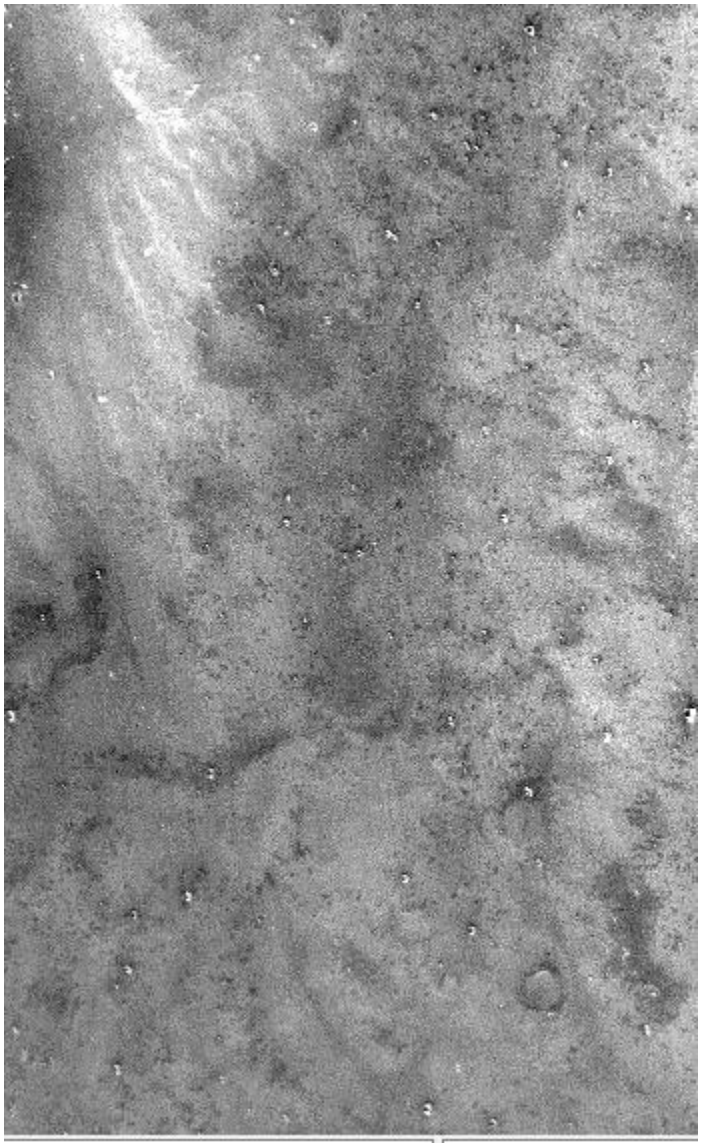

Figure 15. The shape persists in different images

In G16_024454_1653 the shape is seen again, there could even be another face below the wide section as seen in Figure 16.

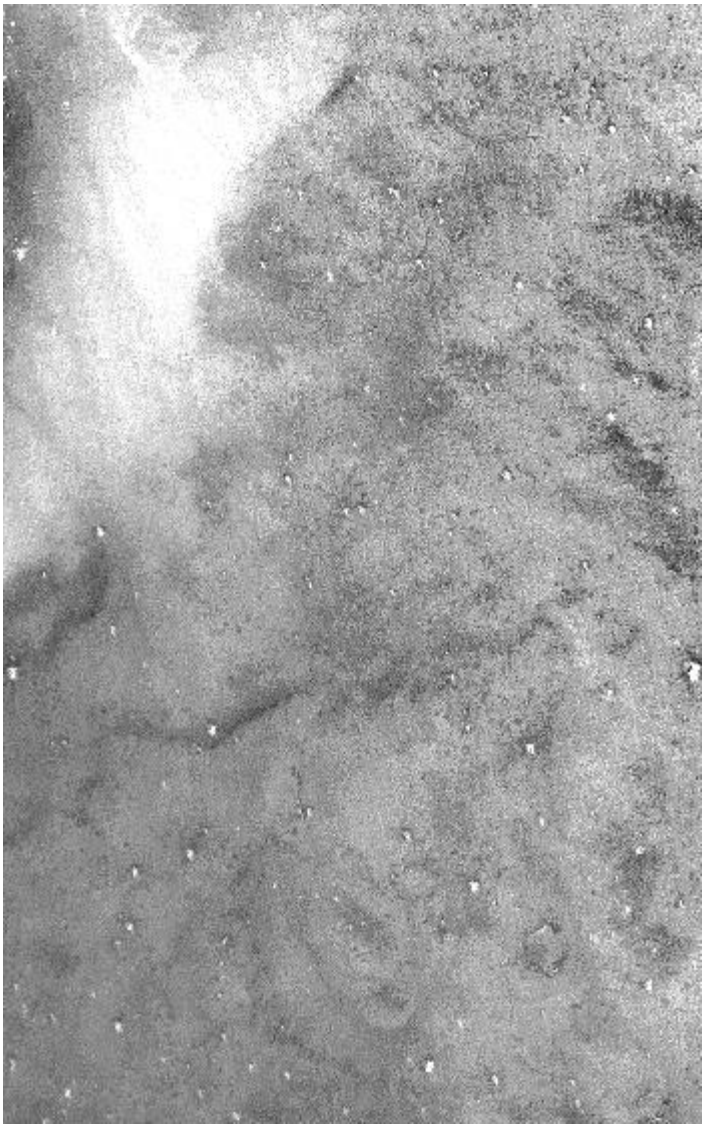

Figure 16: The shapes in another image.

Conclusions

The Nefertiti formation has continued to look more artificial as parts of it are reimaged at higher resolution. This is unlikely to occur by chance; many illusory features disappear when reimaged. The ridge at the front of the hat appears to be unusual not like typical dunes in the area. Some symmetrical shapes under it are shown as predicted features for when this is reimaged. The face is close to former paleoseas that lasted a long time with a thicker atmosphere and potentially habitable environment.

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