

Iapetus Equatorial Ridge: The Understanding from The Quran and The Hadith

N. Ramli^{1*}, H. Noor Isa², A.F. Ramli³ and R. Awang⁴

¹*Faculty of Quranic and Sunnah Studies, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia*

²*Department Physics, Kulliyah of Science, International Islamic University Malaysia, Jln Gombak, 53100 Kuala Lumpur, Selangor, Malaysia*

³*Faculty of Human Science, Sultan Idris Education University, 35900 Tanjong Malim, Perak*

⁴*Independent Researcher*

This research studies the statement about the splitting of the Moon into two as narrated by Quran & Hadith in accordance to scientific studies related to the subject. The author suggests that current scientific findings of the formation of the equatorial ridge on Iapetus differs from the Islamic classical scholars' opinions are not in tandem regarding the splitting and fusing of the moon. This research also applies the methodology of hadith from the writings given from various narrations and hadith literature. The application of document analysis methodology is applied to current concepts by the geologists and astrophysicists on the formation of the equatorial ridge of Iapetus and the ice ridge in Antarctica. The findings establishes that the Iapetus equatorial ridge is a genuine existence that occurred, which split into two and fused back. This image was captured by the satellite sent to Saturn.

Keywords: equatorial ridge; moon split; Islam and scientific; Exegesis

I. INTRODUCTION

The Holy Quran is a primary reference source for Muslims for learning and discussing several religious issues (Ahmad Faizuddin Ramli *et al.*, 2020) regarding theology, ethics, jurisprudence, history, the universe, science (Ali Muhammad Bhat, 2017) etc. In terms of theology, miracles have been included as part of the Islamic theology and creed. One of the polemics which have been debated amongst the Quranic exegesis and scholars was the miracle of Muhammad ﷺ on the splitting of the moon phenomena. In general, it has been written in the Quran and the traditions regarding this miracle of the prophet Muhammad ﷺ. It is stated in the Quran: "The Hour has drawn near, and the moon has been cleft asunder" (The Quran 54:1). The Quran mentions the moon 27 times. On one occasion the word "قمرًا" was mentioned once (QS 25: 61). One of its chapters, is also named al-Baqi, (2002)

meaning the moon. This article describes the event of the moon splitting into two and most Quranic exegesis anticipate the event as; the coming Judgement Day (Juan E. Campo, 2009).

Muhammad Asad (1900–1992), the contemporary Qur'anic exegesis commented on this Ayah as he said that most commentators (he might be referring to the earlier Qur'anic commentators before him) consider that the Ayah refers to a phenomenon said to have been witnessed by several of the prophet's companions and contemporaries of his time. Here, it is understandable that the witnesses may have lived within the prophet's lifetime, which is around 570CE – 632CE. Even though Asad believes that there is no reason to doubt the subjective veracity of these reports, due to the limitations on the understanding about the universe and its infrastructure. Asad assumes that the meaning of the Ayah is actually the possibility of an unusual partial lunar eclipse which produced

*Corresponding author: nusairah@usim.edu.my

a rare optical illusion. He also chooses to translate his understanding of the Ayah by saying that it is referring to a future event specifically to the approaching of the last hour. Here, Asad quotes from Raghīb's Arabic linguistic points. He interprets the phrase 'inshaqqa 'l-qamar ("the moon is split asunder") as a sign of an apocalyptic cosmic cataclysm at the end of time prior to the advent of the day of Resurrection (Asad, 1980). He also quotes that Zamakhshari supports the above-mentioned proposition. Muhammad Asad later concluded that there is none of the Quranic allusions to the 'nearness' of the Last Hour or also known as the Doomsday based on the human concept of 'time'. Raghīb al-Isfahani (1997) interprets the Ayah into three meanings:

1) The moon has been split at the time of prophet Muhammad ﷺ based on the narration of the hadith

'وقيل انشقاقه في زمن النبي صلى الله عليه وسلم'

2) The moon will be split in half during the coming days of Judgement based on the hadith

'وقيل هو انشقاق يعرض فيه حين تترتب القيامة'

3) It is an explicit phenomenon based on the hadith

'وقيل معناه وضح الأمر'

In Tafsir Jalalayn, the Ayah

{اقتربت الساعة} قرئت القيامة

translated as: "The Day of Judgement is coming near or close (to)" While the following Ayah

{وانشق القمر} انفلق فلقتين على أبي قبيس وقبعتان آية له صلى الله عليه وسلم وقد سئلها فقال اشهدوا

رواه الشيخان

translated as: "The moon was broken apart or split into two parts (two halves) on top of mount 'Abi Qubais' and mount 'qa'qa'ani' as a sign which leads or directs one to something important bestowed to the prophet Muhammad ﷺ and when he was asked about it, he said 'Bear witness now or watch it! As reported by two Scholars, al-Bukhari and Muslim" (Jalāl al-Dīn Muhammad ibn Ahmad al-mahalli and Jalāl al-Dīn Abd Rahman ibn Abi Bakr al-Suyutī, 1440). Abu al-Hasan 'Alī ibn Ahmad ibn Muhammad ibn 'Alī al-Wahīdī al-Naysabūrī al-Shāfi'iy write the 'Asbāb al-Nuzūl for this ayah by referring to the Hadith below:

أخبرنا أبو حكيم عقيل بن محمد الجرجاني إجازةً بلفظه أن أبا الفرج القاضي أخبرهم قال: أخبرنا محمد بن جرير قال: أخبرنا الحسين بن أبي يحيى المقدسي قال: أخبرنا يحيى بن حماد قال: أخبرنا أبو عوانة، عن المغيرة، عن أبي السُّحى، عن مسروق عن عبد الله قال: انشق القمر على عهد رسول الله - صلى الله عليه وسلم -

فَعَالَتْ قُرَيْشٌ: هَذَا سِحْرُ ابْنِ أَبِي كَيْبَةَ سَحَرْتُمْ، فَاسْأَلُوا الشُّعْرَاءَ فَسَأَلُوهُمْ فَقَالُوا: نَعَمْ عَدَّ رَأَيْنَا، فَأَنْزَلَ اللَّهُ - عَزَّ وَجَلَّ - {اقْتَرَبَتِ السَّاعَةُ وَانْشَقَّ الْقَمَرُ وَإِنْ يَرَوْا آيَةً يُعْرَضُوا وَيَقُولُوا سِحْرٌ مُسْتَمِرٌّ}

Which can be translated as follows: Abu Hakim 'Aqil ibn Muhammad al-Jurjani informed us (through verbal authorisation); Abu'l-Faraj al-Qadi; Muhammad ibn Jarir; al-Husayn ibn Abi Yahya al-Maqdisi; Yahya ibn Hammad; Abu 'Awanah; al-Mughirah; Abu'l-Duha; Masruq; 'Abd Allah who said: "The moon was split at the time of the Prophet Muhammad ﷺ so the Quraysh said: "This is an act of sorcery/witchery from the son of Abu Kabshah; he has cast a spell on you. Ask, therefore, the travellers whether they saw the moon split. They asked some travellers, and they confirmed it. Allah exalted is He, then revealed (the coming day of the Judgement, and the moon was broken apart or split into two things (two halves). And if they catch sight of the miracle or (sign), they turn away and say: this is persistent sorcery/witchery). (Abū al-hasan 'Ālī ibn Ahmad ibn Muhammad ibn Ālī al-wāhidī al-Naysābūrī al-Shāfi'iy, 1992).

More details about the historical event are discussed by ibn 'Āshūr where he writes that the majority of Quranic commentators believe that this ayah has been revealed upon the polytheists and they witnessed it through the greatness of signs and part of miracles bestowed upon Prophet Muhammad ﷺ which is the splitting of the moon (Muhammad al-Ṭāhir ibn Muhammad ibn Muhammad al-Ṭāhir ibn 'Āshūr al-Tūnisiy, 1992).

He also quotes from the hadith narrated by al-Tarmizī saying that this event happened while the pilgrims were sitting together with the prophet Muhammad ﷺ at Minā and the Moon was broken apart (split into two) which supports the information that it occurred during the time of Hajj. (Muhammad al-Ṭāhir ibn Muhammad ibn Muhammad al-Ṭāhir ibn 'Āshūr al-Tūnisiy, 1992).

Through the biography of al-Halabī, ibn 'Āshūr stated that it is on the night of 14th zu al-Hijjah (the last day of nights at Minā during nights of yaum al-Nafir) where during that time, the polytheists assemble at Minā and among them were al-Walid ibn al-Mughirah, and Abū Jahl, and al-'Āsī ibn wābil and al-'Āsī ibn Hishām, and al-Aswad ibn Abd yagūth, and al-Aswad ibn Abd al-Muṭṭalib, and Zam'ah ibn al-Aswad, and al-Nadhru ibn al-Hāris; they asked prophet Muhammad ﷺ if he was a true/genuine/authentic prophet, if so prove to them by

making the moon split (break apart) into two parts or by half and thus the Moon split into two (Muhammad al-Ṭāhir ibn Muhammad ibn Muhammad al-Ṭāhir ibn ‘Āshūr al-Tūnisiy, 1992). Al-Imām Fakhr al-rāzī in Tafsīr al-Kabīr or Mafātīhu al-Ghaib writes that this ayah is similar to the meaning of ayah an-Najm :57 ^{٥٧} أُرْفَتِ الْأَرْضُ، The hour of Judgement has approached. It is Haq (the Truth) regarding the end of times. Even though if the moon was split as stated in the Hadith (Muhammad ibn ‘Umar ibn al-Husain ibn al Hasan ibn ‘aliyy al-Taimimī al Bakrī al-Rāzīy al-Shāfi‘īy, 2004). The list of the companions of the prophet that witnessed the event as narrated below:

Table 1. List of Hadiths pertaining the splitting of the moon

| No. | Name of the companions | Narrators of the hadiths | The book of hadith and the number of the hadiths |
|-----|------------------------------------|---|--|
| 1. | Abdullah bin Mas‘ud (d. 32H/752CE) | Abu Dawud al-Tayalisi (d.204H) Al-Humaydi (d. 219H) Ahmad bin Hanbal (d. 241H) Al-Bukhari (d.256H) Muslim (d. 261H) Al-Nasa‘i (d. 303H) Abi Ya‘la al-Mawsili (d. 307H) Al-Tabarani (d. 360H) Al-Hakim (d. 405H) | Musnad Abi Dawud al-Tayalisi [no. 278, 293] Musnad al-Humaydi [no. 86] Musnad Ahmad [no. 3583, 3924, 4360] Sahih al-Bukhari [no. 3636, 3969, 3871, 4864, 4865] Sahih Muslim [no. 2800] Al-Sunan al-Kubra [no. 11488, 22489]. Musnad Abi Ya‘la [no. 4968]. Al-Mu‘jam al-Kabir [no. 9996] Al-Mustadrak ‘ala al-Sahihayn [no. 3757] |
| 2. | Abdullah bin Umar (d. 73H/692AD) | Abu Dawud al-Tayalisi (d.204H) Ibn Hibban (d.354H) Al-Tabarani (d. 360H) Al-Hakim (d. 405H) | Musnad Abi Dawud al-Tayalisi [no.2003]. Sahih Ibn Hibban [no. 6496]. Al-Mu‘jam al-Kabir [no. 13473]. Al-Mustadrak ‘ala al-Sahihayn [no. 3756, 3759] |
| 3. | Anas bin Malik (d. 93H/711AD) | Ahmad bin Hanbal (d. 241H) Al-Bukhari (d.256H). Muslim (d.261H). Abu Ya‘la al-Mawsili (d. 307H). Al-Tabarani (d. 360H). Al-Hakim (d. 405H) | Musnad Ahmad [no. 13918, 13919, 13959]. Sahih al-Bukhari [no. 4866]. Sahih Muslim [no. 2802, 3287]. Musnad Abi Ya‘la [no. 2929, 3141, 3254]. Musnad al-Syamiyyin [no. 2581]. al-Mustadrak ‘ala Sahihayn [no. 3761] |
| 4. | Ibn ‘Abbas (d. 68H/687AD) | Al-Bukhari (d. 256H) Al-Tabarani (d. 360H). | Sahih al-Bukhari [no. 4866]. Al-Mu‘jam al-Kabir [no. 10734]. |
| 5. | Father of Jubayr ibn Mut‘im | Al-Tirmidhi (d. 279H) Ibn Hibban (d. 354H) Al-Tabarani (d. 360H). | Sunan al-Tirmidhi [no. 3289]. Sahih Ibn Hibban [no. 6497]. Al-Mu‘jam al-Kabir [no. 1559]. |

| | | | |
|----|-------------------------------------|-----------------------|--|
| 6. | Father of Muhammad ibn Jubayr | Al-Tabarani (d. 360H) | Al-Mu'jam al-Kabir [1561]. |
| 7. | Grandfather of Jubayr ibn Mut'im | Al-Hakim (d. 405H) | al-Mustadrak 'ala Sahihayn [no. 3760]. |

It is interesting to note the hadiths has been reported by many people in various books of hadiths by various narrators on the same subject.

It was narrated by al-Tayalisi as a general announcement on important events that happened at the time of Prophet Muhammad ﷺ. "Narrated `Abdullah bin Masud: During the lifetime of the Prophet ﷺ the moon was split into two parts and on that, the Prophet ﷺ said, "Bear witness (to thus)." (al-Tayalisi, no. 278; al-Nasa'i, no. 11888).

It was narrated within a crowd or a group of people. As for the example, narrated by al-Tirmidhi (Sunan, no. 3285): "Narrated Ibn Mas'ud, may Allah be pleased with him: We were with the Messenger of Allah ﷺ in Mina, when the moon was cleft asunder into two parts. Part of it was behind the mountain, and part of it before it. The Messenger of Allah ﷺ said to us: 'Bear witness' meaning: The house has drawn near, and the moon has been cleft asunder (54:1)". It was a statement and an answer from the challenge of a group of people as narrated by al-Bukhari (Sahih, no. 3637): "Narrated from Anas: That the Meccan people requested Allah's Messenger ﷺ to show them a miracle, and so he showed them the splitting of the moon." "Narrated from `Abdullah: The moon was cleft asunder while we were in the company of the Prophet, and it became two parts. The Prophet ﷺ said, Witness, witness (this miracle)." Even though there are several versions on the hadith proclamations, yet the focal point of the subject matter remains the same as documented; the integrity of the miracle, including the places; the moon split; and the time of its occurrences was proven as had happened at the time of Prophet Muhammad ﷺ was still alive.

These hadiths demonstrate the communication methods on delivering knowledge from one generation to the next generation. It is almost impossible to deny the miracles of the moon splitting into two. In fact, these hadiths were approved and were accepted through the strict mechanism that ensures that the narrator and the narrations are genuine and acceptable according to the Islamic hadith science methodology.

The hadith without a doubt is authentic hence is unquestionable and fully accepted by all scholars from every section, there is no element of falsehood.

It even makes sense to accept the miracles had happened and it is not something that can be confused by other similar events like the moon eclipse or refractions of light in space or an exceptional phenomenon that happened once in China where there were two suns in the sky. Besides, researchers believe that the companions who have had seen the phenomenon of the moon eclipse and solar eclipse were able to differentiate the difference between these rare occurrences and the miracle of the moon split. There is a time where prophet Muhammad ﷺ mentions about these two phenomena (moon and solar eclipse) as below.

Narrated Abu Mas`ud: The Prophet (ﷺ) said, "the sun and the moon do not eclipse because of the death or life of someone, but they are two signs amongst the Signs of Allah. So, if you see them, offer the Prayer (of eclipse) (Sahih al-Bukhari 3204)."

Thus, this shows the significant differences between eclipse and moon splitting. In fact, the refractions of the light can only happen during the day and in the sky, which in contrast to the occurrence of the moon split that happened in the night as mentioned in the hadith at the night of Mina with several witnesses looking at the moon with two halves. The word used in the Qur'an is "انشق" which is similar to the other Arabic word "تَفَرَّقَ" meaning "be split (apart) (Yūsus syukrī farhāt, 2005), which confirms without a doubt that the object was indeed split into two, as the witnesses saw it in a real situation according to the hadiths stated in this article. Moreover, some of the witnesses genuinely agreed that the moon split and as a consequence, they accused the prophet Muhammad ﷺ of bewitching them in order to deny the truth. The denial and rejections by the disbelievers was a strong indication and confirmation of miracles that has happened at the time of Prophet Muhammad ﷺ as they demanded to show them a miracle which is the splitting of the moon yet the disbelievers

(the Quraish) were unable to reject it as it truly happened before their eyes.

It is interesting to see several other interpretations of the Ayah about the same subject. In Tafsir al-Tustari (d. 283H), he comments on the Ayah: "The Hour has drawn near, and the moon has split. During the time of the Messenger of God, when it was cleft into two segments, such that one segment disappeared behind Mount al-Ḥirā'. This was the first of the signs [of the approach] of the Day of Judgement. The following is related from Abū 'Abd al-Rahmān al-Sulamī: 'Once I was with my father in Mada'in (30 km south Baghdad) when the time for the Friday prayer came, so he took me by the hand and went with me to the Friday prayer. Then Hudhayfa b. al-Yamān rose to the pulpit, praised God, and extolled Him, and said, "The Day of Judgement has drawn near, and the moon has split. Is not the Day of Judgement drawing nigh? Has the moon not been cleft asunder? Is this world not fading into decline? Is it not so, that the racetrack is set today, and the race will be on the morrow?" When we went outside again, I said, "O Father, will people race each other tomorrow?" He replied "O my son! You don't realise [what he meant by] 'The race is on the morrow'. He is just saying that whoever works [righteousness] today will excel in the Hereafter.'" His words, exalted is He."

The phenomena by itself are certainly a miracle as reported by al-Bukhari fulfilling the challenge of the Quraish (Sahih, No. 3637), which said: "The people of Mecca demanded from Allah's Messenger ﷺ that he should show them (some) signs (miracles) and he showed twice the splitting of the moon." On the other hand, Taylor and López-Farjeat (2016) states that the interpretation on the miracle of the splitting of the moon had taken place in the context of the discussion and should only be generalized. The prophecy about this supernatural omen from Allah must happen. On that account, when it was proclaimed by a person who assured others that he was to be the prophet, it shows that the phenomenon will occur in the future and must surely happen indeed. Another perfect example is the story of the defeat and triumph of the Romans/Byzantines against the Persians (Surah al-Rum, 30: 1-4).

Additionally, it also conforms with the characteristic of miracles which can be listed as:

- i) The miracle should happen contrary to the custom,
- ii) The miracle occurred to meet the challenge. Wan Zailan Kamaruddin (1997) argues if the phenomenon happened without any challenge or request from a certain group of people to prove something it would not be considered a miracle, and this is in agreement with Islamic scholars.

Thus, other than these criteria the unusual phenomenon can only be described as a herald (Khabar), and not a miracle (Mukjizat) which usually comes with challenges (al-tahaddi). And it is known that Taylor & López-Farjeat was not aware and was unable to differentiate the concept of miracles. Miracles are classified into two parts viz. Mukjizat aqli and Mukjizat Hissi. There is also other crucial element that needs to be considered while discussing miracles which are the subjects of prophecy since it is best categorised as 'the truth' and not as 'bad omen' or miracles. The word 'miracle' can also denote many meanings as defined in Arabic (Lughawi).

Moreover, it is important to emphasise the fact that a prophet is a human being. This means that he has no ability to change any physical creations of Allah. Yet, when it comes to the miracles with Allah's will, a prophet who is powerless to make the rain fall can still be able to pray to Allah during a draught where a prolonged shortage of water supply happens, with the will of Allah, the heavy rainfall persisted for a week following Jumaah (Friday). This happened at the time of Prophet Muhammad ﷺ, and it was recorded in the hadith:

"Anas b. Malik reported that a person entered the mosque through the door situated on the side of Daral-Qada' during Friday (prayer) and the messenger of Allah ﷺ was delivering the sermon while standing. He came and stood in front of the Messenger of Allah ﷺ and said: Messenger of Allah, the camels died, and the passages were blocked; so, supplicate Allah to send down rain upon us. The Messenger of Allah ﷺ raised his hands and then said: (O Allah, send down rain upon us; O Allah, send down rain upon us; O Allah, send down rain upon us. Anas said: By Allah, we did not see any cloud or any patch of it, and there was neither any house or building standing between us and the (hillock) Sal'a. There appeared a

cloud in the shape of a shield from behind it, and as it (came high) in the sky it spread and then there was a downpour of rain. By Allah, we did not see the sun throughout the week. Then (that very man) came on the coming Friday through the same door when the Messenger of Allah ﷺ was standing and delivering the sermon. He stood in front of him and said: Messenger of Allah, our animals died, and the passages blocked. Supplicate Allah to stop the rain for us. The Messenger of Allah ﷺ again raised his hands and said: O Allah, let it (rain) fall in our suburbs and not on us, O Allah (send it down) on the hillocks and small mountains and the riverbeds and at places where trees grow. The rain stopped, and as we stepped out, we were walking in sunshine. He (the narrator) said to Polytheist: I asked Anas b. Malik if he was the same man. He said: I do not know.”

In addition, al-Nawawi (d. 676H) have said: it is proof of the greatness of the prophet Muhammad ﷺ and his nobleness (karamah) on Allah's side which makes the miracles possible for prophet Muhammad to make the heavy rainfalls during the draught persist for seven days without any thick clouds nor cloudiness or any other physical signs. The prophet happened to experience various unusual phenomenon throughout his life even before he became a prophet. A hadith narrated by Jabir:" Jabir b. Samura reported Allah's Messenger ﷺ as saying: I recognise the stone in Mecca which used to pay me salutations before my advent as a Prophet, and I recognise that even now."

Nonetheless there are several Qur'anic commentators and interpretations that implies the Ayah is an illusion or 'unreal', yet there is other Quranic exegesis recorded the phenomena and was written extensively from the book of hadith as mentioned earlier including the hadiths written by Muhammad Jamāl al-din al-Qāsimī. where he interprets the meaning, the same Ayah in his Tafsir, a narration from Ibn Jarīr where he mentioned that this happened during the time of the prophet Muhammad ﷺ in Makkah, before the Hijrah to Madinah, the unbeliever in Makkah requested Prophet Muhammad ﷺ to show them a miracle, and so he showed them the splitting of the moon as proving the truth of his sayings and his prophecy. When they saw the event, they turned away and said that it was Sihir mustamir "Same old magic!". Besides, al-Qāsimī, mentioned that in similar narrations narrated by Anas ibn Malik, Ibn Mas'ud, Ibn

Abbas and from the other Tābi'īn (the generation after the Companions of the Prophet or aṣ-ṣaḥābah) (1994) Anas ibn Malik in kitab Sahih al Bukhari narrated "That the Meccan people requested Allah's Messenger ﷺ to show them a miracle, and so he showed them the splitting of the moon."

Al-Ṭabarī (2005) interprets the Ayah saying that it has been mentioned that the event happened at the time of Prophet Muhammad ﷺ in Makkah, before the Hijrah to Madinah, the ignorance of Makkah requested for a miracle, and so the prophet showed them the splitting of the moon, and they saw it as a miracle and the truth of his prophecy and as the true messenger of Allah, yet they denied the miracle and deceived it and said: "Same old magic!, Muhammad ﷺ has created an illusion on us", and they Allah send down the other next Ayah by the second Ayah of the same surah ' وَإِنْ يَرَوْا آيَةً يُعْرِضُوا وَيَقُولُوا 'سِحْرٌ مُّسْتَمِرٌّ' which means 'Yet, whenever they see a sign, they turn away, saying, "Same old magic!". al-Ṭabarī also quoted several other hadith that illustrates the understanding of the Quran in al-Qamar Ayah 1.

Thus, the Quran and the hadiths provides comprehensive documentation and information regarding the phenomena of the moon splitting into two. Despite the findings of traditionalist resources and non-scientific facts about the Moon, the author noticed that Iapetus equatorial ridge fits the criteria of the moon splitting as represented from the hadiths and the Quran where the features of the Moon split in two can be seen on Iapetus. This suggests a probability that the equatorial ridges might be as the result of the moon splitting into two on the basis of some written historical proof and also the concept of the Antarctic ice ridges where the ice can separate and re-attaches with ridge marks as a result from the process. This suggests that Iapetus might have gone through a more complicated process as the equatorial ridges seem to be more distinctive and clearer than any other features in space or among any other moons in spaces.

II. METHODOLOGY OF UNDERSTANDING THE FORMATION OF THE IAPETUS EQUATORIAL RIDGE

In general, this article postulates the concept of an Iceberg that split and fused back resulting in the creation of a ridge, that is likely what happened to the Iapetus moon of Saturn. Furthermore, both cases of the phenomena are exposed to the

extreme climactic conditions of the extreme freezing temperature. Yet in Iapetus, the temperature is far colder. As far as the author is concerned, no one ever yet has come out with this supposition, and it should be considered for further research.

Considering all three assumptions and analysis on the formations of Iapetus equatorial ridges, the data is still limited as the volume of the ridge is sparse and Cassini observation is only from one side of the satellite. However, Denk *et al.* (2000; 1596) detected the features continuing at the other hemisphere. Castillo (2007) found that the ridge appears to be single, double, or triple in some places. And the flanks are steep with slopes in some sections greater than 30 degrees. The volume of material involved in the ridge seems very large. This ridge spans at least half of the equator and is well developed over a length of ~1600km. While in the cross-section, the ridge looks like a typical (triangular) shape with 200 km base and 18km height. Castillo assumes that the rotations were slowed by the tides of Saturn, and the section of the ridge of the bulges somehow remained even though the rest of the moon returned to a more spherical shape. Iapetus main features were cold and icy as verified by Czechowski (2008) on the composition of the moon, he asserts that Iapetus' low density composing of ice and silicates content which is about 22% by mass and about 8% by volume in accordingly. It is interesting to see such accurate equatorial ridges on the surface of the Iapetus. He also acknowledges that the precise age of the equatorial ridges remains unknown. Czechowski (2008: 63) suggests the formation happened after the Heavy Bombard Epoch (HBE) meaning "the ridge is cut by impact craters in some places, which indicated that is not the most youthful surface feature". Czechowski adds that there is no doubt about the continuity of the ridge. Czechowski comes up with several possibilities on the formation of the equatorial ridges, such as the basic formulae, tectonic regimes: compression versus extension, convective pattern, internal heat, and evolutionary scenarios. Czechowski emphasises the three scenarios: Spin-orbit resonance scenario, Convection in a low-viscosity-interior scenario and impact-generated flow scenario. Still, it is not possible for these suppositions to create a remarkable equatorial ridge.

The author is of the opinion that the formation of the equatorial ridge marked by the clean line on the equator, cannot happen due to any other process. The author therefore reiterates that it must be the result of the splitting of the moon at the equator. For this reason, the author considers the mechanism of the Antarctic rift supports the miracle of the moon split.

III. RESULT AND DISCUSSION

The outcome of the of the discussion is divided into three parts namely,

- i. The discussion on the equatorial ridge of Iapetus through the data collected from previous studies, which will contribute new ideas on the possible cause of the formation of the equatorial ridge on Iapetus.
- ii. Proceed by several sceptical discussions or myths related to the subject matter which was widely circulated and made it impossible to generate further discussions on the subject.
- iii. The historical evidence which will lift the position of this miracle as understood and respected.

The author is aware that there is almost no direct proof related to the equatorial ridge on Iapetus and the splitting of the Moon, yet ancient Indian astronomers and scholars might have documented their observations and interpretations about the Moon's surface in Sanskrit texts, which the researcher suggest further readings on the Vedanga Jyotishe that contains more information on lunar phases, eclipses and planetary movements. The author suggests further research on ancient Indian text include Mahabhrata and the Ramayana as both contain epic poems that describes celestial events and phenomena. Even though at this stage it remains unclear through gleaning the Indian astronomical books. However, the Quran and Hadith documents on this phenomenon is certain and it is one of the significant events in Islamic history. The ancient Indian painting at the Rajput court of Kotah in 18th century has shown the fusion of Islamic and Hindu artistic styles. It helps us to relate between these two civilisations of the ancient India and the Islamic Quran and Hadith pertaining to the discussion on this subject matter. As well as to understand the event better through the

historical perspective we may refer to the image 1 from the Historical proof in the following discussion.

A. The Equatorial Ridges of Iapetus

This is a strange event observed from the earth. The strangest features on Iapetus is that this moon has a straight ridge that runs around the equator, which makes it look incredibly artificial. This is also called the equatorial ridge; discovered by the Cassini space probe. Giles describes the ridge as on average 20km wide and 13km high and stretches for at least 13000km around Iapetus. While Czechowski and Leliwa-Kopystyński (2008: 61) assert that the ridges extended over at least 1400 km along the great circle defined by the equator. Currently the Astronomers are not certain on the exact cause that form the equatorial ridge yet few theories has been discussed about it. Castillo-Rogez *et al.* (2007: 190) assumes that the formation caused by depinning requires a much higher initial rotation rate having a period of ~7 h similar to Porco *et al.* (2005), which suggests that the ridge associates with Iapetus' despinning and this idea is based on the location of the ridge at the equator. While Denk *et al.* (2005: 1596) proposed that it is the result of volcanic activities. Giese *et al.* (2005: 359) suggest that the morphology of the ridge indicates up warming of the surface due to a Techtronic event. Meanwhile, Sandwell and Schubert (2010: 818) assume that the equatorial ridge on the Iapetus was produced by the rearrangement of material accompanying the buckling failure of the lithosphere that is focused on the equator.

Initially, it can be concluded about the formation comprising of three possibilities, which are:

- 1) it may consist of materials that somehow was dumped on the moon's surface;
- 2) it may consist of icy materials that welled up from inside the moon and 'migrated' towards the equator under the influence of forces from the Iapetus rotation;
- 3) The Iapetus moon once span much faster or fast enough to develop a pronounced equatorial bulge. Czechowski (2008: 61) suggests similar ideas where he stated that three possible scenarios lead to the formation of the equatorial ridges: spin-orbit resonance scenario, convection in a low viscosity-interior scenario, and impact-generating flow scenario. However, in this article, there might be one more possible scenario that causes the formation of the ridge, which is,

- 4) The Iapetus might have split once and fused back as alluding to what was mentioned in the Quran.

The discovery of a system of circumferential ribs along the equator by the Cassini imaging team has led to the very interesting proposal of a rapid derotation of Iapetus from a rotation period of approximately 17 hours to the state of synchronous rotation (Porco *et al.*, 2005; Castillo *et al.*, 2005a; 2005b). According to this theory, the ridge system was formed by the large-scale tectonic process associated with the fraying process. This endogenous model sets important dynamic constraints on the timescales of Iapetus formation and the tidal decay of its rotation. Similarly, according to current theoretical estimates, some important timescales in the disentanglement mechanism remain to be resolved. What they have suggested as a possible alternative is that the observed equatorial ridge system is the result of the accumulation of mass by the surface impact of a ring system. Another important strength of this model has to do with the equatorial location of the ridge system when it is a ring remnant. The discovery of satellites around some of the larger objects in the Kuiper Belt could be taken as supporting evidence for this new idea (Brown *et al.*, 2006). They dared to propose this supposition because it could potentially shed new light on the origin of Iapetus and satellite formation in general. For example, the formation of the ring could be related to the inclined orbit of Iapetus (with $i = 7^\circ$) with respect to the local plane of Laplace, which differs greatly from that of all other regular satellites (with $i \approx 0^\circ$) of Saturn. Could this unique feature originate from a strong collision event that led to the formation of an accretion disk? We really do not know. A detailed formulation of the accretion disk formation, ring evolution and mass distribution of the hypothetical ring system is beyond the scope of the present work. In addition, some of the apparent weaknesses of current ring ridge theory, such as its relationship to the tidal fraying process and the formation and maintenance of the equatorial ridge system, need to be addressed in the future. In any case, they hope that this discussion will contribute to the current investigation of Iapetus, one of the most enigmatic objects in the Saturnian system, if not the Solar System. Further analysis of Cassini's data and observations will likely give us a more accurate idea of the geophysical properties of its ridge system.

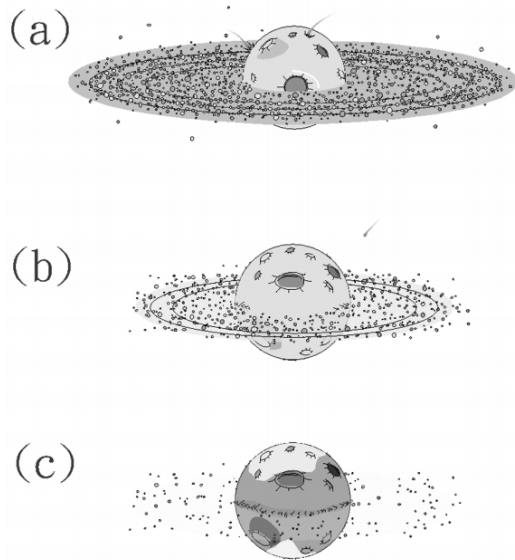


Figure 1. Picture source (Ip, 2006), “which explains an illustration of the three stages of the ring system of Iapetus: (a) co-accretional growth of both Iapetus and its ring system filling up a broad region of the Hill’s sphere; (b) accretion of the ring objects in orbital decay by the proto-Iapetus; (c) final disruption and destructive erosion of the ring system stored within the Roche limit. The figures are not to scale since the radius of the Hill’s sphere of Iapetus should be nearly 49 times the radius of Iapetus itself”.

A study on ice ridges conducted by the AARI has been done in the Shokal’s Kogo Strait. Based on the paper, the study focused on using hot water drilling with computer recording of the penetration rate. This study has suggested few methods on a possibility to measure the thickness of ice ridges sail blocks. This method examines whether the equatorial ridge in Iapetus have experienced a similar process as the ice ridge. Kharitonov (2020: 8) shares the analysis and discussion of the research where he mentioned that the ridges were in fast ice, and, consequently their keel was more strongly eroded by the action of under-ice currents than in drifting ice ridges. He also adds that the ratio of keel and sail is characteristic of ice ridges in fast ice. According to him, the keel/sail ratio, as in 2016, also falls within the range of “mean \pm standard deviation” for the Artic ice ridges. Kharitonov, 2020 describes it as. “Indicate that almost all ice block thickness was multiple of 0.15m, indicating substantial rafting in the ridging processes. The average thickness of ice blocks in the mainsail of ice ridge 1 was 0.29 m, and in the crest at a distance of 31 m; he refers to another -0.19 m. That means that ice ridge 1 is

the result of secondary ridging. One of the signs of the secondary ice ridges is just forming two or several above-water parts of them, located most often at an angle to each other with markedly differing in the thickness of the ice fragments (Tyshko & Kharitonov, 2011). Kharitonov explains more that the crest with a higher sail in the ice ridge 1 formed later, at the final state of ridging. While Ice ridge 2 has extremely large angles of sail and keel slope (84° and 77°) from the side rafted ice. The edge of the left slope of the keel has a fairly loose structure as at a distance of -0.25...0.5m the thermal drill rarely occurred ice blocks on its way below CL.”

Thus, it can be concluded the ridge formation might possibly be measured and calculated by thermal drilling as it is the appropriate method used in the Antarctic and it resembles the stages of ice ridges formations by looking at the cross-section profile of ice ridges and diagram of ice ridges surface in general.

B. Myth on Moon Split

There is always a myth regarding the subject regardless of whether the event is proven to have happened in the past or it will happen in the future. There are several sceptical views on discussing the Moon Split in two as reported in the Quran in the Ayah. “The Day of Judgement has drawn near, and the moon has been cleft asunder” (The Quran 54:1). In 2010, Nasa Lunar Science Institute (NLSI) staff mentioned that “No current evidence reports that the Moon was split into two (or more) parts and the resembled at any point in the past said scientist name, Brad Bailey. Based on this claim in 2010, he did claim that ‘No current scientific evidence resembled at any point in the past which means that the scientist did not find yet any scientific evidence during that year. The basis of believing is not limited to scientific research papers and results only as these areas could not cover every knowledge about the universe. Human-beings have limitation but not for Allah, The creator of all. The Quran or revelation guides human-beings towards understanding the universe and creatures in a better way. It is known by the researchers and scientist that there is lot more research to be done in understanding things around us and some were completed yet the cause remained unknown and uncertain. Some theories in scientific research papers can change from time to time as new things are discovered yet the revelations do not

change at all. The Quran remains the same content from the time it was revealed to the prophet Muhammad ﷺ until today. Even though several things have been discussed about the changes of the writings as the times and people were changing yet the value of it remains the same until the end of days as Allah promised in the Ayah: “Behold, it is We who have bestowed from on high, step by step, this reminder? and, behold, it is We who shall truly guard it [from all corruption]” (The Quran 15:9). As noted by Bhat (2017: 8), The scientific findings of the universe must be consistent to the revelations in the Quran. As a result, true belief should be founded on argument and inquiry, as well as continuous meditation on God's "signs" in the universe, both now and in the future.

Moreover, the Iapetus equatorial ridge was newly discovered by scientists. No wonder scientific research had not been discovered yet about this. Thus, the author sees that it should be considered to conduct further research to understand this event. The Iapetus equatorial ridge indicates the clearest sign that the earth moon had indeed split in two in the past. Shah Waliullah is among the people who have denied the Splitting of the Moon. Schimmel (1985: 81) writes that to him, it may have been a kind of hallucination probably caused by smoke or by the swooping down of a star or any cloud or it may also be an eclipse of the sun or the moon, which might be perceived as the impression that the moon was split in two. Yet, it is known that Shah Waliullah was in unison with hundreds of pious writers that love speaking about the miracle of the prophets to prove prophet Muhammad ﷺ greatness. Another person that seems to have similar views on disbelief on this phenomenon as had happened in the past is Qadi Iyad. He suggestion was due to his inability to access the Indian traditions during his lifetime. Schimmel quoted on his words where he has said. “It has not been saying of any people on earth that the moon was observed that night such that it could be stated that it was not split. Even if this had been reported from many different places so that one would have to exclude the possibility that all agreed upon a lie, yet we would not accept this as proof to the contrary, for the moon is not seen in the same way by different people. ... An eclipse is visible in one country but not in the other; in one place it is total, in the other one only partial”.

Thus, every person deserves their interpretation as they might be caught into their understanding of data and the limitation of reaching the information during their lifetimes. Here in the following paragraph, the author will discuss the historical evidence found about the splitting of the Moon.

C. Historical Proof on Moon Split

Ali Akhbar (2012) writes about the history of the king of Kerala at that time name: Cheraman Perumal Rama Varma Kulashekhar, who is believed to be one of the witnesses of the miracle of Prophet Muhammad ﷺ. Ali Akhbar said that people from inside and outside the Arab peninsular had witnessed the miraculous moment. As for the king himself, he had seen the miracle while relaxing on the rooftop of his palace at Kodungallore on a moonlit night. The king became curious to know about the moon-splitting incident and its origin as he heard from the Arab merchants about the Prophet Muhammad and his miracles. The king got a chance to meet a group of Arabs who visited Kodungallore palace during their visit to Ceylon as the place of prophet Adam (the first human being on earth and the first prophet). The Arab group lead by a scholar name Sheikh Sahiruddhin bin Baqiyuddhin al-Madani who was one of the residents of Madinah and was a Muslim. He managed to answer the questions on the phenomena in Islam asked by the King. According to the story, the King expressed his desire to embrace Islam and to meet Prophet Muhammad ﷺ in Makkah. Thus, the King divided his kingdom into three parts and appointed his sons and nephews to rule each province. He planned properly for his kingdom as he visited several relatives and employees to brief them with all the instructions and rules.

Makhdum (2009: 33) writes similarly on this phenomenon where he mentioned that Muslims in Malabar believes that the King himself one night saw in person the splitting of the moon following which he planned to meet prophet Muhammad ﷺ, and after meeting the Prophet Muhammad ﷺ, he died at Shahar al-Mukalla along his way back to Malabar with a group of Muslims. Annemarie Schimmel (1985) approved the Indian Tradition where she had mentioned clearly that a King Shakrawati Farmad in southern India had indeed watched the Splitting of the moon. Schimmel further explained that the story must rather be well-known in

southern India and was recounted there in later Middle Ages in an Arabic Text. This statement might represent the Figure 2 below.

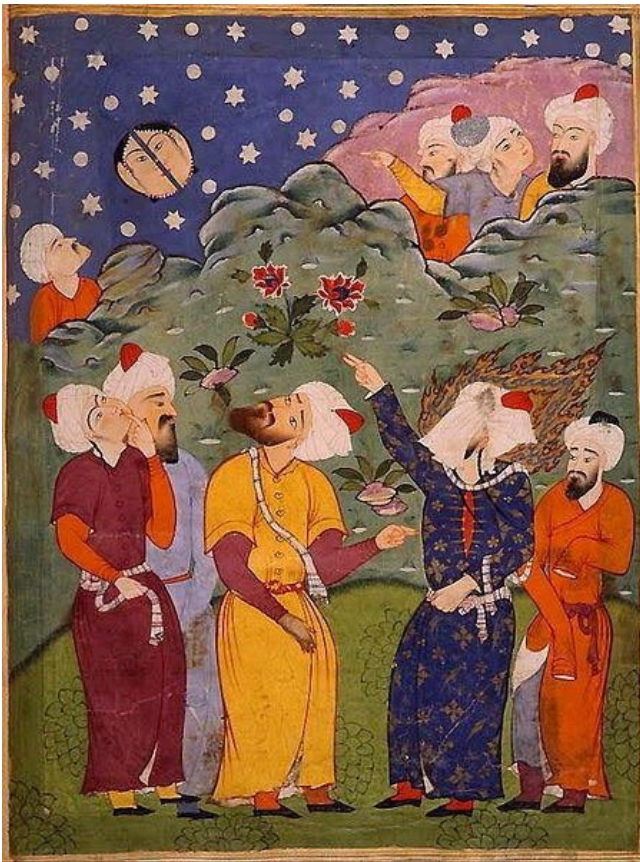


Figure 2: Illustration shows Indian art that is widely used to tell the commentaries of Middle Meccan Surah. (Source: <[Commentary Overview | Corpus Coranicum](#)>.)

Annemarie adds that in the mid-nineteenth century a miniature painted at Rajput (Hindu) court of Kotah explicitly shows the splitting of the Moon with all its details. It is more interesting how Schimmel quoted Rumi on understanding the Splitting of the moon from one of his lyrical poems where the ideas of Rumi's were elaborated sophisticatedly by Jami who loves playing with numbers and shape values following the Arabic letters. According to the ideas, the full moon represents a circular 'ق', and the values of it are 40. This value was split by the prophet and becoming like two crescents shaped which resemble nun whose values 50 numerical number each, and thus proves that the moon has indeed increased in value thanks to the miracle.

Annemarie Schimmel has said that it might be difficult for the rationalistic thinkers and it is not understandable how to explain the splitting of the moon, thus most tried to de-

mythologise that event and other supernatural phenomena. One of the Greek works entitled 'liber denudations' had discussed the subject of Moon Split yet discredits prophet Muhammad ﷺ because they believed that he had been using the Islamic sources to claim on the halving on the two mountains in Makkah. This was known as in 762H, at the time was during the Abbasid dynasty founded in the capital Baghdad. The government had started to sponsor the translation of Greek works and texts which later produced major scientific works of antiquity such as Galen, Aristotle, Euclid, Ptolemy, Archimedes, and Apollonius—all translated into Arabic. This project involves most of the Christians and pagan scholars as well as the Muslims (Gingerich, 1986: 74). Thus, the Arabs acknowledged the Greek works from the translations. While Saliba (2002: 40), affirmed that the subject of the moon's fracture is against the opinions of the Mu'tazilites including al-al-Nazzam (d.845 AD), who is reported to have disputed subject matter.

IV. CONCLUSION

The inferences from the Quran, the hadiths and scientific research accordingly discloses that there might be a possibility of other causes for the formation of the equatorial ridge at Iapetus, which calls upon an in-depth discussion and more research. The Scientific theories should support the revelation in question but researchers and scientists produce peculiar theories related to the universe that moves away from this assertion. The research is not able to measure the exact distance between Jabal Abū Qubays and Jabal al-Qaiqa'ani as mentioned in the hadith as the two Mounts are out of reach from the researchers. This exercise cannot be referred to by utilising contemporary maps or websites as far as the researcher knows, yet we attempt to estimate the driving route as approximately 121 km as illustrated in Figure 3 shown below.

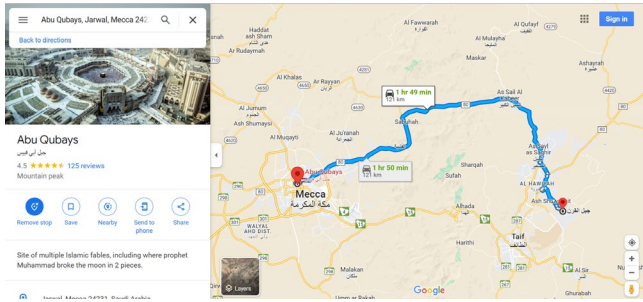


Figure 3. Distance driving between two mountains.

The contemporary name for Jabal al-Qa'q'a'ani is now known as Jabal al-Qarni. According to available online source it is known as Al-Qarni. Overall, numerous historical and literary works that refer to the story of the splitting of the moon can be found based on earlier Islamic sources. Yet, it doesn't provide independent verification of the event

scientifically. Many sources are based on Quran and Hadith as mentioned above and the rest through the arts of Kotah. It has been suggested that non-Islamic sources, such as the Greek historian Theophanes the Confessor, had mentioned about the eclipse of the moon during the reign of the Byzantine emperor (610-641 CE), and this observation to a certain extent, has been interpreted as a possible historical evidence to the event of the splitting of the moon. However, this interpretation is controversial and not widely accepted by Islamic scholars. Overall, while there are various historical and literary references to the narrative on the splitting of the moon, these Islamic sources are generally based on earlier Islamic accounts and do not provide independent verification of the event.

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