

Natural Phenomenon of Twilight in Islamic and Science Perspective

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Abstract: A universe is always process endlessly presents to countless phenomena forever expanding dimensions of space and time. The science explains that (earth's rotation) on its axis brings with it a degree of darkness to earth's part and light on the other part. This phenomenon is springed to changes the earth's surface position to the sun's position as a source of light for the earth. We have learned that such as a circumstances are a phenomenon in which is evening and days change. At dusk twilight, is reflected in the eye so that it can be seen and has significant difference in characteristics color and light wavelengths by day and darkness at night. This is pointed focus in Q.S Al Insiyiq 16 verse that the twilight is reddish. The study is about integrating a natural phenomenon of twilight in an islamic perspective based on the Qur'an causality and the theory scientific perspective of the physics in describing twilight. The method is used library research. As for the instruments used in this study are library studies of integrated sources, using descriptive qualitative data analysis. The result of this study is the conclusion that the dusk event mentioned in Qur'an verse with several interpretations of scholars in his works corresponds to a panda.

Keywords: Islam, light Wave, science, Twilight.

Introduction

Everything in the universe is God's creation, from microscopic particles to macroscopic spheres. As nature continues to process endlessly presents countless phenomena throughout the ever-expanding realm of space and time. All that's available in the universe is created by the regularity or regularity and stability which is occur in a continuity. All evidence of the creation in the universe and its wildlife is embodied in the holy Qur'an. Al-Ghamrawi in the saleh's book (2011) states that there are about 800 verses of kauniyah. According to Zaghul Al-Najjar, there are as many as 1000 verse views as well as hundreds of texts dealing with the phenomenon of the universe. Therefore the Qur'an doesn't only teach people about religion and spirituality, but it does exist as a legitimate supplement and reference to be used by the intellectually is educated muslims and creeds of science.

According to Baiquni, science is a collection of human knowledge to the nature obtained as an agreement of scholars, which a rational analysis of the critical data of measuring by observation of natural phenomena (Fakhri, 2010). The scientific discuss in the Qur'an is crucial. There are more than 6 thousand marks in the Qur'an that contain more than a thousand things encore to science, one of which is a phenomenal study of earth and space revealed by human science with the support of a sophisticated technology (Widiyanti, 2013). In the Qur'an, aside from discussing about the formation of the heavens and the earth also talks about natural phenomena such as the discussion of twilight.

Earth's rotation on its axis (earth's rotation) implement an event of a day and a night called twilight (Atmanto, 2010). When there is a phenomenon of twilight, the earth's surface doesn't directly become a dark, but there is an order of

light becoming dark in the process. Each process that takes place has its own color characteristics.

The Qur'an surah Al Insyiqaq verse 16 mentions that the phenomenon of twilight is reddish. This reddish color is a system of laws set forth by God almighty. Based on the description it should be known how the phenomenon of twilight can occur, it would require research from a scientific and islamic perspective to discuss this phenomenon.

Materials and Methods

The method's used in this article is library research. Library research is a study of literature from previous research reports, both books, and previous records. The purpose of this studying to find the "why" or may be used in searching for an important hypothesis (Priyono, 2014). The study uses secretary-based instruments against integrated sources, analyzing descriptive qualitative data so that it comes to the conclusion that dusk is mentioned in the Qur'an's controversial scientific theory.

Results and Discussion

Twilight is a daily phenomenon in the implications of the earth's rotation (Atmanto, 2010). In language, twilight (red cloud) has the reddish meaning of light that appears on the horizon when sunset. Twilight is mentioned in the contemporary dictionary as the red ray of the sun after sunset (Ali, 1997).

الشفق : بقية ضوء الشمس و حمرتها في اول الليل

It means: "The remains of sunshine and red-lighting at the beginning of the night."

As for the duration of the twilight after sunset depends on the atmospheric conditions (clouds, dust, air pressure, temperature, and moisture) and on the paralleling Angle (Angle between sunset street and local horizon) and varying with seasons and the terestial latitude. Twilight generally is accelerated at the equator over the higher latitudes. If a dense cloud would darken the sky, it would

particularly beat the sunshine or lengthen duration. When a clear sky on the west is below the horizon, sunshine enables it to reflect from the clouds.

The sunshine is squandered by atmospheric particles until they reach the eye of the observer. Atmospheric particles contain 78% Nitrogen; 21% Oxigen; and 1% Carbondioxide, Argon, water vapor, and etc (Koesmaryono and Askari, 2014). The extent of the diffusion of sunshine by these particles is proportional to the power of four wavelengths and frequencies. The shortest waves are purple and blue, the longest ones are red and orange. Whereas the largest frequency is purple and smaller is red. A light is emitted by the sun contains all the spectrum of colors, which according to NASA studies it is known that sun ray has much wavelengths and differing frequencies (Rokhaniyah, 2019). The value of the wavelength and frequency of each color, can be seen on the following table:

Table 1. value of the wavelength and frequency of each color.

Warna	Panjang Gelombang	Frekuensi	Energi Foton
Ungu	380-450 nm	668-789 Thz	2.75-3.26 eV
Biru	450-495 nm	606-668 Thz	2.50-2.75 eV
Hijau	495-570 nm	526-606 Thz	2.17-2.50 eV
Kuning	570-590 nm	508-526 Thz	2.10-2.17 eV
Jingga	590-620 nm	484-508 Thz	2.00-2.10 eV
Merah	620-750 nm	400-484 Thz	1.62-2.00 eV

Source: Zenius Education.

Sunshine when it hits the atmospheric particle will be thrown in all directions. This scattering of light is called the Tyndall effect (Suhadi and Wiranda, 2019). Light with a higher frequency is wasted more, whereas a lower one is squandered or not squandered (passed on). At the time of twilight, sun ray covers a greater distance than during the day. Light at noon with shorter mileage is dominant in blue, because blue light has a higher frequency than another is tossed in all directions. So it beats the colour of another diffused light. At sunset, the sunshine is dominated by red and

orange. These two colors have the lowest frequencies, so light is slightly squashed by atmospheric particles and passes on to the earth. The blue light of the sun at noonday is eliminated because it rarely travels far enough.

The phenomenon of twilight is a sequence of processes that change its color. When the sun begins to set out on the western horizon, the light appearing on the earth's surface is reddish yellow. As soon as the sun sets, the dark-yellow light of the twilight gradually turns crimson because the sun is getting lower, so that the scattering of sun ray in twilight of the atmosphere decreases, so on until the earth becomes dark. According to us navy observatory Washington D.C. (2006) twilight consists of three stages:

1. Civil twilight: when the sun's position is 0o to -6 o below the horizon, objects in the open space are still exposed to a set of boundaries and are then exposed to some light-colored stars.
2. Nautical twilight: the sun stands -6 o through 12 o beneath exposed objects still visible but vaguely in shape, by this time bright stars are all visible.
3. Astronomical twilight: when the sun is in -12o to 18 below the horizon, the earth's surface becomes dark, so that everything that sits in the open becomes invisible to its borders and shapes. At this point all the stars were already visible (Atmanto, 2010).

Based on the above description, it is possible to explain the reddish of the phenomenon of twilight in terms of scientific physics. Accordingly, the phenomenon of twilight is explained in Q.S Al-Insyiqaq 16 verse which reads as like this:

فَلَا أُفْسِمُ بِالشَّفَقِ

"Then surely I swear by the red light of twilight"

The twilight phenomenon or "syafaq" in arabic has the dual meaning of *syafaq abyadh* and *syafaq ahmar*. Ibn katsir interpreted Al-Insyiqaq's letter that *syafaq* is humrah (Katsir, 1998). He proposes the opinion of various scholars that *syafaq* is the humrah at the horizon from the sunset until the time of isha or its approach to 'atamah (milking after a half of the night, rather than stealing). The presence of this twilight is a sign that it is entering

maghrib time and is mandatory for muslims to establish maghrib prayer. Explained in Q.S Al-Isra' verse 78:

اقم الصلاة لدلوك الشمس الى غسق الليل وقرآن الفجر ان قرآن
الفجر كان مشهودا

It means: elevate "to be converted from after the sun slips until dark of night and (it is revived). Indeed the prayer was witnessed (by angels)".

As for the twilight phenomenon there are two maghrib events of *syafaq ahmar* and *syafaq abyadh*. Both appear at different times and at the level of lighting in the night sky. *Syafaq ahmar* appears firstly than *syafaq abyadh*. *Syafaqul ahmar* is often referred to as the red cloud associated with the setting of the sun. This *syafaq* is used as the end of maghrib's time, where its loss of yellowish color marks the end of maghrib prayer and the start of isya's time.

حديث سلمة بن الاكواع رضي الله عنه : ان رسول الله صلى الله
عليه وسلم كان يصلي المغرب اذا غرب الشمس وتوارت
بالحجاب . رواه الجماعة الا النسائي

It means: Address yourself from the Salamah son Akwa' ra. He had said: "Surely the messenger of prophet Muhammad (peace be upon him) did maghrib prayer when the sun was setting and was gone." (H.R. Jama'ah unless An-Nasa 'i).

Astronomers believe that's said to set when the sun reaches the horizon and rises when it rises on the horizon. Based on this it could conclude that the sun's position on the sun (sunrise) as a sign and the end of the prayer corresponds to the sun's position at maghrib. In prayer maghrib is also encouraged to wait for it at the beginning of time and insist on putting it off until the stars emerge. Being a discerning creature of God to keep in mind all that is commanded and to shun what it has been forbidden. As the word of god in the Qur 'an surah Ar-Raad verse 15 reads:

وَلِلَّهِ يَسْجُدُ مَنْ فِي السَّمَوَاتِ وَالْأَرْضِ طَوْعًا وَكَرْهًا وَظُلْمًا بِأ
أَعْدُوِّ وَالْأَصَالِ

It means: "Only to God is obedient to all that is in heaven and in the earth either of his own consciousness or under compulsion, (and prostrate himself) his shadow in the morning and in the evening" (Ar-Raad: 15).

By of the foregoing, God displays physical symptoms a sa parable divided into three stages: our ignorance is like seeing in the darkness of night, the uncertainty of seeing red light at twilight, and the obvious explanation that bespeaks his beauty and majesty. This suggests that science is very relevant to islamic values in which the Qur 'an is the first authentic reference and is the standard for intellectual muslims.

Conclusions

Sunshine that is dispersed to squashed by atmospheric particles based on frequency and wavelength of each color spectrum. The largest frequency in purple and blue is squandered the atmosphere. Whereas the smallest frequencies of red and orange are slightly duplicated or not squandered by the atmosphere, they are passed on to the earth, resulting in a reddish vision of the sky. Q. S. Al Insiyiq verse 16 discussed in this writing revealed in the time of the prophet Muhammad SAW where no scientific theory was yet to explore the phenomenon of twilight. The Kallam of God embodied in the Qur 'an is *qoth'i* or surely, passed down to his people as a center of knowledge, instruction and guidance in the journey of life. Ignorance is human nature to learn, doubts signifying more study until it finds a concrete understanding of the beauty and majesty of God almighty.

Conflict of Interest: This statement states that all authors have no conflict of interest regarding the publication of this article. All Authors have seen and approved the submitted manuscript. We guarantee that the article is the original work of the author. We guarantee that the article has not received prior publication and is not being considered for publication wherever. On behalf of all co-Authors, the Authors concerned will be fully responsible for the submissions.

This research has not been submitted for publication or published in whole or in part elsewhere. We attest to the fact that all the Authors listed on the title page have contributed significantly to this work, have read the manuscript, approved their submission to the

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