QiST: Journal of Quran and Tafseer Studies
ISSN (Online): 2828-2779
Received: 15-03-2025, Revised: 01-10-2025
Accepted: 02-10-2025, Published: 04-10-2025
DOI: https://doi.org/10.23917/qist.v4i2.9164

The Meaning of *Dukhān* and *Wardatan Ka-ddihān* in Surah Ad-Dukhan (10-11) and Surah Ar-Rahman (37): A Scientific Thematic Study

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Abstract

This study examines the Quranic terms "Dukhān" and "Wardatan Ka-ddihān" found in Surah Ad-Dukhan (10–11) and Surah Ar-Rahman (37) through a thematic scientific lens. Using a qualitative approach, it bridges classical tafsir (interpretation) with modern astronomical insights. The term "Dukhān" is interpreted as cosmic dust, possibly symbolizing the universe's final phase, while "Wardatan Ka-ddihān" is linked to the explosive death of a star, resembling nebulae such as the Rosette Nebula. These findings suggest that the Quran contains descriptions that align with observable cosmic phenomena, highlighting its relevance to scientific exploration. The research underscores the potential of religious texts to inspire inquiry and deepen understanding of the universe. By integrating faith and science, this study encourages interdisciplinary dialogue and opens new pathways for interpreting sacred texts in light of contemporary knowledge. Ultimately, it contributes to both Quranic scholarship and the broader conversation on the harmony between spirituality and scientific discovery.

Keywords: *Dukhān; Wardatan Ka-ddihān; Doomsday; Astronomy.*

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Introduction

The Qur'an presents profound insights into the natural world, often describing cosmic phenomena through symbolic and metaphorical language. Two notable terms are dukhān (دُخَان), meaning "smoke" or "mist," found in Surah Ad-Dukhān, and wardatan ka-al-dihān (وَرْدَةً كَالدِّهَان), meaning "a rose-like [object] resembling oil," appearing in Surah Ar-Raḥmān. According to Zaghloul El-Najjar, dukhān refers to the primordial gaseous cloud that emerged following the Big Bang, serving as the raw material for celestial formation [1]. Meanwhile, wardatan ka-al-dihān is interpreted as a vivid depiction of a glowing red nebula, resembling the petal-like structure of a cosmic flower. Although these verses were revealed centuries before the advent of modern astronomy, their symbolic resonance aligns remarkably with contemporary discoveries concerning cosmic dust and nebulae formed after stellar explosions [2].

The paper seeks to analyze these terms using a scientific lens, aiming to explore the relevance of the Quranic descriptions in the context of contemporary scientific understanding.

The problems to be discussed in this research are: first, what is the meaning of Dukhān and Wardatan Ka-ddihān in Surah ad-Dukhan and Surah Ar-Rahman according to conventional tafsir? Second, how can these two phenomena be related to modern scientific findings in astronomy and cosmic physics? Third, what is the relevance of Dukhān and Wardatan Ka-ddihān to the understanding of the end of times according to the Qur'an and scientific knowledge? This journal aims to interpret the meaning of Dukhān and Wardatan Ka-ddihān based on the Qur'anic texts and tafsir studies, as well as to examine the relationship between the phenomena depicted in the Qur'an and modern scientific theories, particularly in astronomy and physics. The study aims to present an analysis that demonstrates the alignment between revelation and scientific discoveries and their contribution to the understanding of the end of times from both a religious and scientific perspective.

This research also seeks to fill the gap in the problem in the scientific tafsir study. Although many studies have explored scientific tafsir in the Qur'an, few have connected the natural phenomena in Surah ad-Dukhan and Surah Ar-Rahman with modern scientific theories in depth. Most previous studies focused more on traditional tafsir and did not explore how these phenomena relate to current scientific knowledge. This gap provides space for research that connects conventional tafsir with modern astronomical findings, particularly in understanding Dukhān and Wardatan Ka-ddihān as natural phenomena that may occur at the end of time.

Several previous studies have analyzed natural phenomena in the Qur'an. Armainingsih, in her research, focused on scientific tafsir studies, linking natural phenomena in the Qur'an with scientific theories, but her study did not delve specifically into Dukhān and Wardatan Ka-ddihān in the context of modern physics and astronomy [3]. Similarly, research by Wisnu Sasongko discusses the concept of the apocalypse in the Qur'an, but does not connect it with scientific knowledge related to celestial collisions and supernovae that could influence perceptions of the end of time. This article positions itself differently from previous studies as it not only focuses on religious tafsir but also explores the scientific understanding of the cosmic phenomena described in Surah ad-Dukhan and Surah Ar-Rahman. This research will present an analysis that combines classical tafsir with scientific findings in cosmic physics and astronomy, which will contribute a new perspective to scientific tafsir studies. The differentiation of this article lies in its more comprehensive approach to linking modern scientific theory with natural phenomena described in the Qur'an, which has not been widely discussed in previous studies

Method

The research presented in this study employs a qualitative research methodology using a library research approach. The library research method is a form of descriptive research that involves the collection of secondary data from written sources, such as books, journals, and articles, which are relevant to the study topic. The study focuses on the thematic analysis of Dukhān and Wardatan Ka-ddihān as described in the Qur'an, specifically in Surah ad-Dukhan, verses 10-11, and Surah Ar-Rahman, verse 37, and interprets these phenomena from a scientific perspective [4].

Descriptive and Analytical Methods The descriptive method is used to illustrate and clarify the meanings of Dukhān and Wardatan Ka-ddihān as found in the Qur'anic verses. This method aims to provide a detailed explanation of the textual references in the Qur'an and describe the phenomena in the context of their religious and scientific implications. The research further incorporates analytical methods, wherein the meaning and significance of the terms are explored not only through classical interpretations but also in alignment with modern scientific knowledge, particularly in the field of astronomy and physics [5].

Thematic Analysis A thematic analysis is applied to examine the Qur'anic verses thematically, identifying key ideas and concepts related to the phenomena of Dukhān and Wardatan Ka-ddihān. This approach helps explore the connections between the religious texts and their alignment with scientific phenomena, such as cosmic events (e.g., supernova explosions, celestial

collisions, etc.) described in the Qur'an. This analysis bridges the gap between traditional interpretations and modern scientific understanding, emphasizing the relevance of these Qur'anic descriptions in light of contemporary scientific findings [6].

This research also aims to address the gap in existing studies by integrating scientific perspectives into the analysis of Dukhān and Wardatan Ka-ddihān. While previous studies have explored the Qur'an from a theological or historical perspective, there has been limited exploration of how these phenomena relate to astronomical and physical concepts. By focusing on the scientific interpretations of these phenomena, this research contributes a new dimension to the understanding of the Qur'an and its alignment with scientific knowledge

The study uses secondary sources, including books, articles, and journals, to gather information and provide insights into the natural phenomena described in the Qur'an. This method ensures that the research findings are based on credible and reliable sources, thus enhancing the study's scientific value

Result and Discussion

Analysis of the Meanings of Dukhān and Wardatan Ka-ddihān from a Scientific Perspective

The term Dukhān in Surah Ad-Dukhan, verses 10–11, may be interpreted as a representation of natural phenomena associated with celestial collisions, such as asteroid or comet impacts, which produce dust and gas particles dispersed throughout the atmosphere. This phenomenon correlates with the asteroid impact theory, which posits that such events can obstruct the penetration of sunlight to the Earth's surface for extended periods, potentially triggering ecological disruption and global climate anomalies. The exegeses of al-Ṭabarī and Ibn Kathīr describe dukhān as smoke that veils the sky, serving as a form of divine punishment or a sign of the Day of Judgment, resulting in human suffering and famine. Al-Qurṭubī further elaborates that dukhān may be understood as a tangible smoke or mist that will emerge near the end of times, enveloping the sky and broadly affecting human conditions [7],[8],[9]. This interpretation opens a pathway for scientific approaches that link the Qur'anic term to atmospheric consequences of major geological or cosmic events.

Meanwhile, the term wardatan ka-ddihān in Surah Ar-Rahman, verse 37, exhibits a visual resemblance to the phenomenon of a supernova—an explosion of a massive star that produces luminous patterns in shades of red, akin to the petals of a rose. Such patterns have been documented in modern astronomical observations, including images of the Rosette Nebula and the floral-like

structures of stellar remnants. The exegeses of al-Ṭabarī and al-Qurṭubī interpret wardah as a vivid red hue appearing in the sky, resembling molten rose or red oil, symbolizing the destruction of the heavens on the Day of Judgment. Tafsir al-Baghawī similarly describes the sky as transforming into a red fluid, resembling a rose, as a metaphorical depiction of cosmic upheaval. This interpretation invites a cosmological reading that links Qur'anic imagery to large-scale transformations in the universe [10].

This study also explores the potential impact of supernova explosions on life on Earth, including atmospheric disturbances that may trigger drastic global climate changes. A detailed analysis of the term Dukhān reveals similarities with geological events such as major volcanic eruptions or asteroid impacts, which are scientifically known to produce long-term environmental effects, including global temperature decline, acid rain, and ecosystem disruption. These findings reinforce the hypothesis that cosmic descriptions in the Qur'an possess not only theological and symbolic dimensions but also exhibit coherence with contemporary scientific explanations regarding the effects of large-scale natural events on life on Earth [11].

Context of the Verse: Surah Ad-Dukhan Verses 10-11

The analysis of these verses from Surah Ad-Dukhan highlights the manifestations of Allah's oneness in governing the universe and serves as a reminder to the disbelievers of Mecca of His greatness. Although they acknowledged that Allah is the Creator of the universe, they denied the message of Prophet Muhammad (PBUH) and mocked his call. The verses illustrate the consequences of their denial, as Allah afflicted them with severe famine, making them realize His wrath. However, their faith at that moment was driven by desperation rather than true conviction. The verses also emphasize that the punishment did not leave a lasting impact on them, as they returned to disbelief once the hardship was lifted. The passage concludes with a warning of a greater torment on the Day of Judgment, where neither intercession nor regret will be of any benefit. This analysis reflects Allah's justice and wisdom in dealing with those who reject His signs [12].

Definition of Dukhān in the Holy Quran

This study presents various exegetical perspectives concerning the term dukhān mubīn ("clear smoke") as mentioned in Sūrat al-Dukhān (Qur'ān 44:10). Classical commentators such as Ibn Kathīr, al-Ṭabarī, and al-Qurṭubī offer two principal interpretations. The first views dukhān as a worldly punishment, referring to the severe famine that afflicted the Quraysh following the supplication of the Prophet Muḥammad (peace be upon him) against their

persistent disbelief. The intensity of their hunger and weakness reportedly caused them to perceive the sky as if it were filled with smoke. This interpretation is elaborated by Ibn Kathīr in Tafsīr al-Qur'ān al-ʿAẓīm and supported by al-Ṭabarī in Jāmiʿ al-Bayān, both of whom link the phenomenon to a historical event during the Prophet's lifetime. The second interpretation considers dukhān as one of the major eschatological signs of the Hour (ʿalāmāt al-sāʿah), a future event that will envelop humanity in smoke, with particularly severe torment inflicted upon the disbelievers. This view is endorsed by al-Qurṭubī in al-Jāmiʿ li-Aḥkām al-Qur'ān, who situates the smoke within the broader framework of apocalyptic signs preceding the Day of Judgment.

Several scholars have sought to reconcile the two dominant interpretations of dukhān by proposing that the phenomenon did indeed occur during the Prophet Muḥammad's (peace be upon him) lifetime as a form of worldly punishment, but will also reappear as one of the major eschatological signs preceding the Day of Judgment. This integrative approach highlights the interconnectedness between historical events and apocalyptic prophecies, underscoring the divine justice and wisdom of Allah in punishing disbelievers both in this world and the Hereafter. Contemporary thinkers such as Muḥammad al-Ghazālī and Sayyid Quṭb emphasize the moral and spiritual dimensions of dukhān, interpreting it as a divine warning against arrogance and rejection of truth. Meanwhile, Muslim scientists like Zaghloul El-Naggar offer a scientific perspective, suggesting that the Qur'ānic reference to smoke may correspond to natural phenomena such as atmospheric pollution or cosmic disturbances. These modern interpretations reflect a growing effort to harmonize classical exegesis with contemporary scientific discourse, thereby enriching the interpretive framework of Qur'ānic studies in the modern era [13],[14],[15].

Tafsir of Dukhān in Surah Ad-Dukhan Verses 10-11

One exegetical tradition recounts that the Prophet Muḥammad (peace be upon him) invoked a supplication against the Quraysh due to their persistent disbelief and obstinacy. As a consequence, they were afflicted by a severe famine and hunger, to the extent that they perceived the sky as being filled with smoke—a reflection of their physical weakness and suffering. This interpretation is supported by the companion ʿAbdullāh ibn Masʿūd (may Allah be pleased with him), who identified the dukhān mubīn ("clear smoke") mentioned in Sūrat al-Dukhān (Qur'ān 44:10) as a worldly punishment manifested through the famine. An alternative interpretation, however, views the smoke as one of the major eschatological signs of the Hour, as referenced in several prophetic traditions. According to this view, a great smoke will envelop humanity in the end times, serving as a divine warning and affliction. The nature of this punishment is

closely tied to the Prophet's supplication, and classical sources note that the smoke was lifted following the Quraysh's plea for mercy. Some scholars further link this verse to broader apocalyptic events, interpreting the punishment as part of the unfolding scenes of the Final Hour.

The Impact of the Occurrence of Smoke in the Sky and on the Earth in the Holy Quran

The smoke event caused by a meteor impact on Earth will lead to numerous disasters, including drought, famine, cessation of rainfall, and the drying of land, resulting in a prolonged famine. The Qur'an has highlighted all these effects, as explained in Mafatih al-Ghayb (The Keys to the Unseen). Drought, famine, and their impact on the earth and sky: "O Allah, make their years like the years of Yusuf (Joseph), so the rain ceased, the land became barren, and Quraysh suffered from severe famine..."This indicates the cessation of rainfall and the drying of the land, which directly affected people's lives on Earth.

"A man, due to extreme hunger, would see something like smoke between him and the sky."This illustrates the connection between famine and the sky, portraying the phenomenon that appears as smoke in the eyes of those suffering from extreme hunger. Smoke as a Cosmic Sign of the Last Day: "On the Day when the sky will bring forth a visible smoke." (Ad-Dukhan 44:10).

The Relevance of the Verse – Surah Ar-Rahman, Verse 37

The explanation of Imam Fakhr al-Din al-Razi in his interpretation "Mafatih al-Ghayb" regarding the phenomenon of the skies splitting on the Day of Judgment as a sign of a great event is enlightening. Al-Razi clarifies that the splitting signifies separation and collapse, resulting from the emergence of fire and the spread of divine punishment on the earth and sky. He compares the sky to molten copper or liquefied silver, reflecting the grandeur and intensity of the scene. This event is connected, according to al-Razi, to the accountability of all deeds, where individuals face the consequences of their actions, as mentioned in Surah Al-Inshiqaq: "O mankind, you are laboring toward your Lord with [great] exertion and will meet it." Al-Razi interprets the red color seen during the splitting as a symbol of the fire that envelops the entire scene.

Additionally, he connects this with other verses related to the splitting of the sky, such as Allah's statement: "And the sky split, and it will be weak that Day." He explains that these verses depict various scenes of the terrors of the Day of Judgment, where creation is held accountable for their deeds. In conclusion, al-Razi points out that this scene represents the moment when everything is revealed, and the wrongdoers are recognized by their marks, preparing them to

receive the consequences of their actions, which underscores the justice of Allah on a difficult Day for the disbelievers.

Definition of "Wardatan Ka-ddihān" in the Holy Quran

Meanwhile, wardatan ka-ddihān refers to a phenomenon where the sky splits into a bright red color, resembling a glowing rose, as mentioned in Surah Ar-Rahman (verse 37). This phenomenon is closely related to the concept of a supernova explosion in astronomy. When a massive star explodes, it releases an enormous amount of energy, dispersing gas and dust into space. This process produces a distinctive bright red color, similar to the description of "a red flower like glistening oil." In other words, a supernova explosion can create visual patterns that resemble wardatan ka-ddihān as seen from Earth.

In Tafsir al-Qurtubi, the verse "When the sky is split apart" refers to the sky cracking open on the Day of Judgment. The phrase "And becomes [like] a rose [colored] like oil" has been interpreted in different ways. Mujahid and Al-Dahhak stated that the sky will become as clear as purified oil, while Sa'id ibn Jubayr and Qatadah described it as turning red. Other scholars explained that the sky will melt like oil due to the extreme heat of Hell, becoming thin and reddish. Abu Ubaid and Al-Farra likened it to red leather, emphasizing the intensity of the fire. Ibn Abbas compared it to a pink horse whose color changes with the seasons, and Al-Farra supported this by noting how horses' colors shift throughout the year. Al-Hasan described it as resembling poured oil with multiple colors, while Zaid ibn Aslam compared it to the dregs of oil. Al-Mawardi suggested that the sky's original color is red, but it appears blue due to atmospheric barriers; on the Day of Judgment, when these barriers are removed, its true red color will be revealed.

Modern science provides further explanations of this phenomenon through physics and astronomy, showing that remnants of supernovae form bright red nebulae, such as the Rosette Nebula. This occurs when dispersed gas and dust from an exploding star create a glowing, flower-like pattern in space. Additionally, nebulae like the Rosette Nebula serve as stellar nurseries, where new stars are born. This adds a scientific dimension to the phenomenon, portraying it as part of the life cycle of stars in the universe [16].

The Impact of the Appearance of a "Wardatan Ka-ddihān" in the Sky and on Earth Due to the Splitting of the Sky in the Holy Quran

Fakhr al-Din al-Razi views the splitting of the sky on the Day of Judgment as one of the major signs indicating the destruction of the universe, reflecting the magnitude and terror of the event. The text links the rupture of the sky to the destruction of human and jinn dwellings, emphasizing the universality of the

catastrophe affecting all of God's creations. The comparison of the sky turning red upon splitting signifies the devastating impact of fire, which melts materials like copper or iron until they become liquid. Al-Razi explains that on the Day of Judgment, the sky will dissolve like oil or fatty substances, representing a state of melting and changing colors.

The Day of Judgment is a fundamental part of faith, and the text underscores God's punishment of both humans and jinn according to their deeds in the world. Additionally, the text suggests a harmony between the Quranic description of the sky's splitting and scientific theories regarding the end of the universe through the destruction of celestial bodies. Al-Maraghi further elaborates that the splitting of the sky involves its cracking and the disruption of its order, causing it to display various colors—red, yellow, and blue—similar to changing dyes. Ultimately, the text highlights God's power to control the universe and prepare it for its end, reflecting His wisdom and justice in holding His creations accountable for their actions [17].

The Relationship Between Exegetes and Scientists Regarding the Concept of Dukhān and a "Wardatan Ka-ddihān"

The verses of the Holy Qur'an have been a source of inspiration and contemplation for scholars and exegetes throughout the ages, calling them to explore the mysteries of the universe and the miraculous nature of the Qur'an from various perspectives. Among these remarkable verses is Allah's saying: "When the sky is split apart and becomes [like] a rose [colored] like oil" (Qur'an 55:37), which has sparked deep questions about the meanings behind the comparison to smoke and the rose-like oil. This Qur'anic verse serves as a point of convergence between the interpretations of classical exegetes and the analyses of contemporary scientists, reflecting a strong connection between religious texts and modern science [18].

The Emergence of Dukhān and a "Wardatan Ka-ddihān"

Ibn Kathir explained that smoke is one of the signs of the Day of Judgment. Another view suggests that the "clear smoke" is one of the major signs of the Hour, as mentioned in the hadiths of the Prophet (peace be upon him), where a smoke will cover all people at the end of time [19].

From the previous explanation, it is evident that understanding smoke is related to the knowledge of the creation of the universe. In Maurice Bucaille's book, it is stated that the creation of the heavens and the earth has multiple aspects, including the gaseous state, which represents the initial form of celestial matter, and the symbolic enumeration of the heavens as seven. We will later explore the meaning of these numbers. The dialogue between God and the

heavens and the earth is symbolic, aiming to illustrate that after their creation, they submitted to God's commands [20].

This research investigates the discipline of astronomy, a branch of science concerned with the observation, movement, and evolution of celestial bodies. Astronomical inquiry is grounded in empirical observations conducted by professional astronomers who monitor various cosmic phenomena occurring beyond Earth's atmosphere. Utilizing advanced instrumentation, such as high-resolution telescopes, researchers are able to examine distant objects in space. Among these tools, the Hubble Space Telescope—operating in Earth's orbit—plays a pivotal role in capturing detailed data on the motion and characteristics of celestial entities, including the Sun, stars, the Moon, meteors, and other planetary bodies. Through such technological advancements, astronomy continues to expand our understanding of the universe and its dynamic processes [21].

We must understand the process of the beginning of the creation of the universe, including the heavens and the earth, as explained by the Big Bang Theory, proposed by astronomers. The Big Bang Theory is a scientific explanation stating that the heavens and the earth initially formed as a result of a massive explosion. According to this theory, the universe originally consisted of an extremely dense and hot substance, which then exploded with immense force, leading to the expansion and evolution of the universe. The matter released in the explosion consisted of gas and dust clouds formed under high pressure and great velocity, causing the dispersion of cosmic material and the formation of galaxies and the solar system [22]. Regarding the phrase "Wardatan Ka-ddihān" Allah mentions in Surah Ar-Rahman (55:37): "When the sky is split apart and becomes [like] a rose [colored] like oil."

In Al-Maraghi's Tafsir, he explains that on the Day of Judgment, the heavens will crack, their order will be disrupted, and celestial bodies and stars will scatter from their orbits. The sky will turn red and melt until it appears like oil or similar substances used for anointing. This meaning is also reflected in other verses, such as Surah Al-Infitar (82:1-2): "When the sky breaks apart, and when the stars are scattered," Surah Al-Inshiqaq (84:1-2): "When the sky is split asunder, and obeys its Lord—and it must do so," and Surah Al-Haqqah (69:16): "And when the sky is split apart, it will become frail that Day." Al-Maraghi further explains that the sky will dissolve just as molten oil or silver melts under intense heat. It will also change colors, similar to dyes used for painting—at times appearing red, at other times yellow, and sometimes blue.

In Al-Maraghi's Tafsir, he explains that when the Day of Judgment arrives, the heavens will crack, their order will be disrupted, and celestial bodies

and stars will scatter from their orbits. The sky will turn red and melt until it appears like oil or similar substances used for anointing.

The phenomenon of the explosion of massive stars is called a supernova. A supernova is a giant star in the galaxy that emits an enormous amount of energy and then "destroys itself" due to a massive explosion, marking the end of the star's life. The supernova explosion occurs in an organized manner with an extremely powerful blast that happens only once. The distance between the light produced by a supernova and other stars in the galaxy is estimated to be about 30 million light-years. If this phenomenon occurs at a far distance, the dust resulting from the supernova will scatter and spread indefinitely, leading to disruptions in the planetary system within the solar system or preventing its proper formation.

In 1929, an American astronomer conducted research (observations) on what happens in the universe, particularly in space. In this study, he used a giant telescope built by Edwin Hubble at Mount Wilson Observatory in California. Initially, he observed stars using this giant telescope and discovered that their light shifted toward the red end of the spectrum. As these stars moved away, they became more clearly visible from Earth's surface. According to the laws of physics, when the spectrum of light from stars moves away from the observation point, it shifts toward the red color. Through Edwin Hubble's observations, it was found that starlight tends to shift toward red, revealing that celestial bodies such as stars and galaxies are all moving away from each other and expanding apart.

The Cause of the Appearance of Dukhān and a "Wardatan Ka-ddihān".

As Allah Almighty said in the Quran, Surah Ad-Dukhan, verse 10: "Then watch for the Day when the sky will bring a visible smoke." When discussing smoke, the smoke that the Prophet Muhammad (peace be upon him) referred to as one of the major signs of the Hour is not widely recognized in various segments of society. The smoke mentioned by the Prophet as a sign of the great apocalypse is not an ordinary smoke that appears in a specific region or at a particular time. Rather, this smoke is of great intensity and serves as both a warning and a punishment from Allah Almighty for humanity [23].

According to another opinion, this smoke has not yet occurred. This view is based on the hadith of the Prophet (peace be upon him), which states: "The Hour will not come until ten signs appear," and among these signs is "the smoke." The smoke mentioned here is one of the major signs of the Hour, marking the beginning of the world's destruction. Therefore, it is not merely the ordinary

smoke that has recently appeared in different regions. This interpretation aligns with the view of Ibn Abbas (may Allah be pleased with him).

Life began on Earth when the atmosphere lacked oxygen (O_2) and was primarily composed of carbon dioxide (CO_2). The process of photosynthesis then led to the production of free oxygen and ozone. Modern genomic analyses allow us to understand how the diversity of species on this planet is interconnected. Carbon dioxide and methane in the atmosphere contribute to warming the Earth's surface through the greenhouse effect. Currently, the increasing levels of carbon dioxide in the atmosphere are causing global warming on our planet.

In 1824, Joseph Fourier was the first scientist to identify the greenhouse effect, a heating process caused by celestial bodies that possess an atmospheric layer. The greenhouse effect can lead to the thinning of the atmosphere due to increased cosmic radiation and the concentration of carbon dioxide, which is one of the greenhouse gases. This is due to the accumulation of trapped heat in the atmosphere as a result of human activities and gases that damage the ozone layer. These emitted gases intensify the greenhouse effect, reflecting more thermal radiation waves that are absorbed by the atmosphere and then re-radiated back to the Earth's surface [24].

This phenomenon is extremely dangerous if the increase in greenhouse gases and their impact on the Earth's surface and atmosphere continue. It is important to recognize that carbon dioxide emissions primarily originate from human activities, such as the burning of fossil fuels, including coal, oil, natural gas, and others [25]. Then, as Allah Almighty said in Surah Ar-Rahman, verse 37: "When the sky is split apart, and it becomes [red] like oil or molten copper." Fakhr al-Din al-Razi explains in his commentary on Surah Ar-Rahman, verse 37, the phenomenon of the splitting of the sky, which begins with flames emerging from molten copper, turning the sky red. This signifies that the flames have reached the sky, making it resemble molten iron that turns red when heated. Furthermore, flames mark the end of something existing in the universe. The Day of Judgment is one of the signs of the final hour in which Muslims believe, and it is a fundamental tenet of faith in Islam. When the fire appears, no one will be able to escape it, as the entire universe will transform into a blazing inferno from which no one can be saved. Then, when the sky is violently torn apart, there will be divine retribution from Allah upon both humans and jinn, who will face the consequences of their deeds and be held accountable.

The next explosion resulting from the collision of the second meteorite will cause the Earth's orbit to reverse. At that moment, the Earth, which has been rotating from west to east for several billion years without interruption, will pause for a moment and then begin rotating from east to west. As a result of this

second impact, in addition to altering Earth's rotation, the ecological system, the global order, and the continuity of life for all creatures will be disrupted.

Another consequence of this collision will be the fracturing of Earth's crust and the eruption of volcanoes worldwide, causing volcanic dust to form clouds that cover the entire planet: "When the Occurrence occurs, there is no denial of its occurrence. It will bring down some and raise others. When the earth is shaken with a violent quake, and the mountains are crushed to powder, they will become scattered dust." (Surah Al-Waqi'ah [56]: 1-6). Additionally, molten lava will suddenly emerge from the depths of the Earth, covering its entire surface: "When the earth is shaken with its [final] earthquake, and the earth discharges its burdens, and man says, 'What is [wrong] with it?'" (Surah Az- Zalzalah [99]: 1-3).

The air will also be filled with dust and smoke, blocking sunlight: "On the Day the sky will be like murky oil." (Surah Al-Ma'arij [70]: 8). The sky will turn red, followed by acid rain, boiling seawater, and massive floods engulfing the land: "And when the seas are erupted." (Surah Al-Infitar [82]: 3). Furthermore, if a massive asteroid or meteorite collides with Earth, its impact will be catastrophic for life on this planet, marking the beginning of the world's destruction. Harun Yahya explains that one of the signs of the Day of Judgment—the rising of the sun from the west—is a consequence of a meteorite impact. According to Harun Yahya, citing the words of Bediuzzaman Said Nursi, two meteorite collisions are expected, leading to devastating effects. Additionally, this collision will produce a deafening sound that will shock Earth's inhabitants. Harun Yahya also mentioned that the first collision, which will result in a massive explosion, will halt the Earth's orbit, which has been stable for billions of years. Night will not turn into day; one side of the Earth will remain in perpetual darkness, while the other will be in constant light. The Earth's crust will shift, causing earthquakes everywhere, followed by volcanic eruptions spewing lava flows [26].

The splitting of the sky is also caused by cosmic rays, which significantly contribute to the destruction of the atmospheric layer. If these cosmic rays penetrate the atmosphere, they will have a direct impact on the Earth's surface. It is crucial to understand that the atmosphere is the Earth's outer protective layer, designed to shield the planet from the dangers of cosmic radiation, meteor radiation, and solar radiation [27].

Scientists agree that cosmic rays are high-energy radiation resulting from the remnants of massive explosions, particularly the explosions of giant stars (supernovae). As energy propagates, cosmic rays move rapidly and extensively, influenced by solar activity. Cosmic radiation plays a significant role in the

greenhouse effect, leading to rising temperatures in the atmosphere, in the oceans, and on the Earth's surface.

Implications and Signs of the Apocalypse

The phenomena described in Surah Ad-Dukhan and Surah Ar-Rahman are not only scientifically explainable through cosmology and physics but also carry deep religious significance. In Surah Ad-Dukhan, dukhān is depicted as one of the major signs of the apocalypse, indicating the arrival of the end times. The smoke or dust filling the sky serves as a warning to humanity about the coming of Judgment Day, bringing suffering to those who do not believe. In this context, dukhān is not merely a natural phenomenon but a divine sign demonstrating God's power and reminding humanity of His greatness [28].

Similarly, wardatan ka-ddihān describes a celestial phenomenon as part of the signs of the apocalypse. When the sky splits open and turns red like a rose, it signifies the eventual destruction of everything in the universe. The scientific interpretation of this event as a supernova explosion, creating visual patterns resembling a rose, shows that science and religion can go hand in hand in explaining the great signs of the end times. The connection between scientific and religious perspectives provides a deeper understanding of how we view the universe and its inevitable fate [29].

Suggestions for Further Research

Future research can explore comparisons between classical and modern interpretations of the terms dukhān and wardatan ka-ddihān, enriching perspectives on how these phenomena can be understood from both religious and scientific viewpoints. Classical interpretations, which focus on symbolic and spiritual meanings, can be compared with scientific discoveries that provide rational explanations for these phenomena

Conclusion

This study demonstrates the scientific relevance of the Qur'anic terms Dukhān and Wardatan Ka-ddihān, as found in Surah Ad-Dukhān (10–11) and Surah Ar-Rahmān (37). Through a thematic and qualitative approach, it was revealed that Dukhān corresponds to cosmic dust, potentially symbolizing the universe's final phase, while Wardatan Ka-ddihān reflects the visual characteristics of massive stellar explosions, resembling the Rosette Nebula. These findings affirm that Qur'anic descriptions are not merely symbolic or theological, but also resonate with observable cosmic phenomena.

The analysis highlights the complementary relationship between revelation and scientific inquiry. Traditional tafsir, often rooted in spiritual and

linguistic interpretation, gains new dimensions when examined through the lens of astronomy and cosmology. By aligning Qur'anic imagery with astrophysical realities—such as interstellar dust and supernova remnants—this study opens pathways for contextualized understanding of scripture in light of modern science. It also reinforces the idea that the Qur'an engages with universal truths that transcend temporal and disciplinary boundaries.

Overall, this research contributes to the growing field of interdisciplinary studies between religion and science. It encourages scholars to explore Qur'anic verses not only as theological guidance but also as intellectual prompts for scientific exploration. The harmony between faith and empirical knowledge, as demonstrated in this study, offers a compelling framework for future research that integrates spiritual insight with scientific rigor

Author Contributions

Ilham Habibullah: Conceptualization, Methodology, Writing – review & editing, Supervision, Project administration. **Deki Ridho Adi Anggara**: Methodology, Writing – review & editing, Investigation. **Mahmud Rifaannudin, Utari Nur Pratiwi**: Conceptualization, Methodology, Writing – review & editing, Investigation.

Acknowledgement

Thanks to my parents, who always support my educational journey. and to my siblings who always support me too. To my thesis supervisor, who always provides input in writing this journal

Conflict of Interest

The authors declare no conflicts of interest.

Funding

This research did not receive any financial support.

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