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The History of *Istiwa'* in the Development of Islamic Falak

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Abstract

The history of *istiwa'* represents one of the oldest scientific heritages in the history of astronomy, marking the position of the sun directly overhead, where the shadow of a vertical object becomes minimal or disappears. Since the civilizations of Egypt and Babylonia, this method has been used to regulate time and determine geographical directions. It was later refined by Greek scholars and eventually Islamized by Muslim astronomers as an instrument of falak (*miqyās al-zill*) to determine prayer times and the direction of the qiblah. This study employs a qualitative method with a library research approach, examining classical sources such as *al-Qānūn al-Mas'ūdī* by al-Bīrūnī and modern literature on *Rashdul Qiblah*. The analysis was conducted descriptively and comparatively to trace the epistemological continuity between classical traditions and contemporary practices. The findings reveal that the concept of *istiwa'* evolved from empirical observation into a theoretical falak system that integrates scientific and theological dimensions. Despite the advancement of digital technologies, the shadow-based observation method remains relevant for its accuracy and spiritual value. Future research is encouraged to explore the recontextualization of *istiwa'* in modern falak education to strengthen the integration of science, faith, and ecological awareness within Islamic religious practices today.

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A. Introduction

History records that the phenomenon *Stuttgart'* It has been known since ancient civilizations as a simple but very urgent method in understanding the circulation of the sun for the needs of human life, from the preparation of calendars, the setting of agricultural seasons, to the timing of religious rituals. Historical facts show that the Egyptians and Babylonians used gnomons to observe the length of the Sun's shadow,[1] while the Greek civilization later developed this concept in more complex Sundial instruments.[2] Since the time of the Prophet Muhammad (PBUH), Islam began to use *istiwa'* to determine the time of *Zuhr* and the direction of the Qibla through the Shadow of the Opposite Upright (*miqyās*). In the modern

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context, especially in the form of *istiwa' a'ẓam* or *Rashdul Qiblah*, it is still a big concern for Muslims, including in Indonesia, to this day. Millions of Muslims straighten their qibla when the sun is over the Kaaba on May 27–28 and July 15–16. This phenomenon even often makes national news because it involves a very large public participation, ranging from educational institutions, mosques, to the general public.[3] Although the digital application of qibla determination is growing rapidly, simple observation methods based on the shadow of objects are still relevant and trusted by the public.[4] This phenomenon shows that astronomy has a social as well as spiritual dimension that continues to live on in the practice of modern Muslims.[5] Thus, it can be concluded that in history, the phenomenon Stuttgart' not only does it have a practical function in determining the direction of the Qibla and the time of prayer, but it also contains social and spiritual values that make it remain relevant in the lives of Muslims until the modern era.

Academic studies of the history of *istiwa'* in Islamic astronomy show an interesting historical continuity between the classical tradition and modern scientific approaches. Historically, the concept of observing the shadow of the sun has been an important part of the Islamic astronomical system since the classical era, as explained by al-Bīrūnī in al-Qānūn al-Mas'ūdī, which confirms that the position of the sun at the time Stuttgart' is an accurate basis for determining the direction of the Qibla and the time of prayer through the instrument *miqyās*.[6] The next development in the archipelago was marked by various studies on instruments Stuttgart'. trace the history of the development of qibla measuring devices in Indonesia, including sticks Stuttgart', which has been used since the Islamic empire to the colonial period as a medium for astronomical observation. [7] Similar studies show that the tradition of using this tool still persists in Islamic boarding schools and educational institutions, indicating the continuity of traditional falak practices in the modern context.[8] These findings show that the practice Stuttgart' in Indonesia is not only rooted in classical observation, but also undergoes continuous historical adaptations over time. Meanwhile, other studies prove that the calculation of spherical trigonometry with the correction of magnetic declination at the moment of *istiwa' a'ẓam* produces an accuracy almost identical to direct observation of the sun's shadow.[9] The research reinforces these findings by showing that the phenomenon *Rashdul Qiblah* which occurs every May 27–28 and July 15–16 is still an accurate reference in determining the direction of the Qibla in the computational era. This study confirms that the observation of the sun's shadow remained a continuous scientific

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principle from classical times to modern astronomical practices.[10] Overall, this recent literature study shows that *istiwa* has a long history. This began with the scientific observations of classical Islamic scientists, accepted in the tradition of the archipelago's astronomy, now undergoing a reinterpretation in modern measurement systems that all of them affirm the historical continuity between the classical observation tradition and scientific innovations in the development of Islamic astronomy.

In his classic work, al-Qānūn al-Masʿūdī, al-Bīrūnī (1954) asserted that an important tool in astronomy is to see the shadow of the sun through an upright stick (*miqyās*). He explained that the beginning of the time of *Zuhr* is determined by the time the sun shifts from the central point (*zawāl*), and from this shadow it is also possible to calculate the correct direction towards the Kaaba. His point of view shows that the *istiwa* method is not only a practical technical practice, but also has a theoretical basis that places the shadow as the correct instrument of astronomy. Therefore, it can be considered that the "*istiwa* phenomenon" is one of the early ways to build a philosophy tradition based on observation, verification, and scientific empiricism. Moreover, this perspective shows the relationship between the practical and theoretical aspects of the Islamic astronomical tradition.

Based on this background, this study aims to explain how *istiwa* developed in the astronomy tradition by looking at concepts, techniques, and consequences from classical to modern times. In particular, this paper emphasizes that Muslim scientists, including al-Bīrūnī, understood the phenomenon of *istiwa* and used it as an important tool to determine the timing of prayer and the direction of the qibla. The ultimate goal is to show the relationship between classical thought and modern astral practice, as well as the advantages of this research to enrich Islamic astrology literature in the modern era. This research is expected to make a significant contribution to the development of Islamic astronomical studies, both in the academic field and in the socio-religious practice of the Muslim community, by looking at *istiwa* from a historical perspective.

B. Method

In this study, a qualitative methodology was used, along with a library research approach. This method was chosen because the purpose of the research is to investigate the history, ideas, and evolution of istiwa phenomena from a classical to modern

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perspective. Primary and secondary sources are the two main categories of data sources used. Classical astronomical works such as al-Bīrūnī, especially al-Qānūn al-Masʿūdī, which explains in detail how the sun's shadow determines the time and direction of the qibla, are the main sources. In addition, Nusantara falak manuscripts, such as Sullam al-Nayyirain by Muhammad Mansur al-Batawi, are used. These manuscripts record how istiwa tools were used in the Southeast Asian region. Modern astronomical researchers have written studies on the phenomenon of *Rashdul Qiblah* and its relationship to the technological age.[3]–[5]

The data collection technique is carried out by studying, recording, and classifying relevant literature based on the period and context of its use. Classical literature is studied to understand the initial form and function of the concept of *istiwa'* in Islamic civilization, while modern literature is analyzed to see the continuity and transformation of the concept in contemporary philosophical practice. According to literature studies, it allows researchers to discover a variety of perspectives from books, journals, and manuscripts, so that they can strengthen their research's theoretical arguments.[11] This method produces data that is not quantitative. Instead, they derive from historical, descriptive, and analytical narratives, which are then critically studied to find connections between classical theory and contemporary practice. Therefore, this approach is suitable for answering the formulation of problems in the Islamic philosophical tradition that emphasizes the historical and practical aspects.

Data analysis was carried out descriptive-comparatively. Descriptive analysis describes the phenomenon of istiwa in classical and modern literature, while comparative analysis compares the perspectives of classical figures such as al-Bīrūnī with contemporary practices such as *Rashdul Qiblah*. [12] states that rather than describing data objectively, the focus of qualitative analysis is on interpreting the meaning contained in the text, not just a description of facts. Therefore, this study seeks to interpret the phenomenon of *istiwa'* in a complete historical framework by looking at methodological and social continuity from time to time. This approach allows research to find the continuity of the epistemology of the phalache that is observational, verifiable, and contextual. In other words, this research approach not only provides an explanation of

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historical events, but also explores the philosophical and scientific significance of the istiwa phenomenon in the Islamic philosophical tradition.

C. Results and Discussion

Research Results

1. **Conceptualization and the Dimension of *Istiwa'***

Etymologically, the term *istiwa'* (الاستواء) comes from the root *istawā–yastawī–istiwā'an* which in Arabic means "upright," "balanced," or "on top of something" [13]. In the context of Islamic astronomy, *istiwa'* is used to describe the moment when the sun is directly overhead somewhere, resulting in the shadow of an object that is perpendicular downwards or even disappears completely. This phenomenon is an important reference in astronomy because it marks the event of zawāl, which is when the sun crosses the celestial meridian, which is then used to determine the beginning of the *Zuhr* prayer time and measure the direction of the qibla through the shadow of objects (miqyās al-zill). In addition, this term also has a theological resonance in the Qur'an, as in the Qur'an. *Ṭāhā* [20]:5, which uses the form of the word *istawā* to denote a high and balanced position, thus reinforcing the meaning of the parallelism between the cosmic and spiritual order in Muslims' understanding of celestial phenomena.[3], [4], [14] Thus, *istiwa'* is not just an astronomical technical term, but also has a symbolic dimension that reflects the balance and regularity of Allah's creation in the view of Islamic cosmology.

The phenomenon of *istiwā'* in the history of Islamic civilization is rooted in the tradition of sun observation that has been known since pre-Islamic times. In the Egyptian and Babylonian civilizations, the shadow of the sun was used as a time-measuring device through an upright staff or gnomon [1]. This development was later perfected by the Greeks who invented the sundial or sundial as an early astronomical tool [2]. When Islam came, this phenomenon was not only adopted, but also given a new religious and scientific meaning. Since the time of the Prophet Muhammad (PBUH), the observation of the shadow of an upright object has been used to determine the time of *Zuhr* and the direction of the Qibla, making istiwā' not only a scientific activity, but also an integral part of worship practice. This phenomenon shows that from the beginning, Muslims have placed natural observation as a means of understanding the order of the cosmos while upholding the spiritual dimension in daily life.

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In the archipelago, the practice of *istiwā'* began to be known since the time of the Islamic kingdom and developed along with the spread of astronomy in Islamic boarding schools and religious institutions. According to [7], the *istiwā'* stick is used as a tool to determine the direction of the Qibla and the time of prayer before the presence of a compass or digital application. Astronomical texts such as Sullam al-Nayyirain by Muhammad Mansur al-Batawi show that shadow observation has become an important part of the astronomical learning system in Indonesia. This tool is used not only for astronomical purposes, but also as an educational medium in understanding the daily cycle of the sun. This historical data shows that istiwā' has a dual function: as a scientific instrument and as a means of transferring religious knowledge. Thus, the *istiwā'* phenomenon in the archipelago represents the historical continuity between the tradition of classical observation and local adaptation that has continued to this day.

In the modern context, the phenomenon of *Rashdul Qiblah* is the most popular form of *istiwā'* actualization. Every May 27–28 and July 15–16, the sun is directly above the Kaaba so that the shadows of upright objects around the world point directly to the Qiblah.[3] This observation data is used by the wider community, including educational institutions and mosques, to simultaneously straighten the direction of the qibla. Although Qibla determination technology is now accessible through digital applications, shadow-based observation methods are still trusted due to their high accuracy.[4] Research [15] It shows that the calculation of spherical trigonometry with the correction of magnetic declination at the time of *istiwā' a'ẓam* is almost identical in result to direct observation. This fact confirms that the *istiwā'* phenomenon is still a strong scientific basis and continues to be relevant in modern astronomical practice, linking classical methods with today's computational approaches.

2. Genealogy and Historical Evolution of *Istiwa'*s Knowledge

The phenomenon of *istiwa'*, or in classical astronomical terminology known as solar noon (the sun at the point of culmination), was known long before the birth of Islamic civilization. Ancient civilizations such as Egypt and Babylon used gnomons, which are upright sticks embedded in the ground to measure the length of the sun's shadow, as a means of determining the change of seasons, time of day, and geographical direction [1]. In Egyptian culture, this tool became the basis for the construction of obelisks, which functioned not only as religious symbols, but also as solar calendar instruments that indicated the time of the event' (Ruggles, 2005). Meanwhile, the Babylonians perfected its use by creating a scale of

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measurable shadows on a flat plane, which in turn influenced the development of the sundial in the Greek world. In classical Greece, scientists such as Anaximander (610–546 BC) and Eratosthenes (276–194 BC) are recorded as having adopted gnomons to measure the height of the sun and determine the circumference of the earth based on the difference in shadow length between the cities of Syene and Alexandria [2], [16]. This observation was a milestone in the birth of geometric astronomy and showed that the *istiwa'* method was essentially rooted in a cross-civilizational scientific tradition. Thus, the practice of observing the shadow of the sun, which would later be known in Islam as *miqyās al-zill* is actually an intellectual heritage that has undergone conceptual evolution from the Egyptian-Babylonian to Greek eras, before finally being absorbed, systematized, and purified within the framework of Islamic cosmology.

In addition to Egypt–Babylonia–Greece, two other great civilizations also developed the concept of *istiwa'*. A similar tradition also developed in India through the use of śaṅku in the *Jyotisha* to determine the height of the sun and compile a calendar,[17] and in China through the use of shadow poles (*Biaozhu*) as a north–south determinant and the basis of the calculation of the classical calendar.[18] Although not always referred to as "*istiwa'*", the practice of observing the culmination of the sun in these two civilizations enriched the global astronomical heritage that would later be inherited by the Islamic world.

These four centers of civilization formed the basis for the understanding of the culmination of the sun which later entered the Islamic world, an important phase in the history of the evolution of the concept of *istiwa'* and the use of the solar shadow measuring instrument. After the works of Greek astronomers such as Ptolemy and Eratosthenes were translated into Arabic through a major translation movement at Bayt al-Hikmah, Baghdad, during the time of Caliph al-Ma'mun (813–833 AD), Muslims began to develop a new theological method of observing the sun: the observation of the signs of Allah's greatness in the universe *(āyāt kauniyyah*) [19]. In this context, tools such as the gnomon (al-miḳyās) are no longer merely scientific devices, but also instruments of worship, used to accurately determine the time of prayer based on *istiwa'* al-shams or the culmination of the sun over the local sky [20]. Early evidence of the application of this system can be traced from early Islamic astronomical manuscripts such as the works of al-Khawārizmī (d. 850 AD) and al-Farghānī (d. 861 AD), which explained the theory of shadows and the measurement of the height of the sun mathematically based on Greek heritage but adapted to the needs of the

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Shari'i[21]. Through translated works such as *Almagest* and Greek astronomical tables, the concept of *istiwa'* was adopted and developed within the framework of Islamic science. Al-Khawārizmī in *Zīj al-Sindhind* writing down a shadow table to determine the culmination of the sun,[21] while al-Farghānī explains the relationship between the length of the shadow, the geographical latitude, and the height of the sun in *Jawāmi'Ilm al-Nujūm*.[22]

Furthermore, in the 10th century, scientists such as al-Bīrūnī perfected *istiwa'* calculation by combining trigonometric theory and empirical observation, making it the foundation for calendars and prayer times throughout the Islamic world[23]. al-Battānī corrected the Ptolemaic data through precision trigonometry, and Ibn al-Shāṭir in Damascus used the giant miqyās al-zill in the Umayyad Mosque to determine the daily *istiwa'* as the basis for the scheduling of prayers.[23] This tradition continued in the Maragha and Samarkand observatories when Naṣīr al-Dīn al-Ṭūsī and Ulugh Beg built giant gnomon instruments for the systematic measurement of the sun's culmination.[24] Therefore, the term *istiwa'* in Islamic treasures not only marks the culmination point of the sun, but also a symbol of the integration between science, worship, and the cosmic order, illustrating how the Greek scientific heritage was retranslated into an integral part of Islamic history.

In the Middle Ages of Islam, astronomical scholars began to document the phenomenon *Istiwa' A'ẓam*, i.e. when the sun is exactly over the Kaaba on a certain date so that the entire shadow of the upright object points to the Kaaba, a method that was then widely used to calibrate the direction of the Qibla in the Islamic world.[25] In the modern era, *istiwa'* observations remain the basis for determining the time of *Zuhr*, the calibration of the sundial, the validation of precision astronomical data, as well as the verification of computerized astronomical calculations, showing the long continuity of the historical development of this phenomenon from ancient civilizations to contemporary astronomy.[26] Thus, *istiwa'* is not only an astronomical concept, but also a symbol of the integration between knowledge, faith, and the time of worship in Islamic civilization.

3. The *Istiwa'* Dialectic: From Cosmic Phenomena to the Social Construction and Time Sovereignty of Muslims

The development of *the concept of istiwa'* in Islamic history should not be seen as merely a technical evolution of the mapping of the sun's shadow. More than that, *istiwa'* is the meeting point between the observation of the *heavens* and the order of the earth which forms the social identity of Muslims. Here, *istiwa'* undergoes a dialectical process: from an

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objective-cosmic natural phenomenon to a social construct that regulates the rhythm of civilization and affirms the sovereignty of the people's time.

3.1 Epistemological Transformation: From Profane Knowledge to Sharia Instruments

In the early days of the transmission of knowledge in Baitul Hikmah, Muslim scientists did not simply adopt theories *Gnomon* from the Greek tradition (*Almagest* by Ptolemy) or India (*Siddhanta*). There is an epistemological leap in which the instrument *Stuttgart'* What was once used for profane purposes such as marine navigation and agriculture, was reoriented into sacred instruments.[19, pp. 12–15]

Al-Bīrūnī in his works *Ifrād al-Maqāl fī Amr al-Aẓlāl* deconstructing the use of shadows. For him, the shadow of the moment *Stuttgart'* is the most honest indicator that nature provides for determining the transition of solar energy from rising (*Ascension*) heading down (*Decline*).[27, pp. 45–50] This dialectic changed the view of Muslims towards time; Time is no longer something that flows meaninglessly, but fragments of worship whose boundaries are determined by the position of the sun at the point of culmination. This cosmic phenomenon then became a "public truth" accessible to anyone, from scientists in observatories to commoners in the desert.

3.2 The Institution of *Istiwa'* in the Archipelago: The Dialectic Between the *Fiqh* Tradition and the Local Authority aan *Istiwa'*: The Role of Muwaqqit in the Social Structure of the City

Sociologically, the importance of the phenomenon *Stuttgart'* triggered the birth of a unique professional position in the history of Islamic civilization: *Muwaqqit*. A *Muwaqqit* Not just an azan officer, but a professional astronomer who is responsible for time management in large mosques.[28, p. 128] In mosques such as the Umayyad Mosque in Damascus, *Muwaqqit* calibrating the sundial (*mizwala*) the daily giants are right at the moment *Stuttgart'*.

This institution created a "Social Construction of Time" (*Social Construction of Time*). In the midst of a classical society that did not have a watch, the mosque courtyard became the center of social gravity because it was there that the only source of accurate time was located. David A. King notes that society's reliance on observation *Stuttgart'* in the mosque creates collective discipline.[29, p. 210] *Istiwa'* to be a symbol of social order; Markets are opened and closed, and the affairs of the state bureaucracy are arranged on a shadow basis *mizwala* that have been verified by the *Muwaqqit*.

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3.3 *Istiwa'* in the Archipelago: A Dialectic Between *Fiqh* Tradition and Local Authorities

In the archipelago, history *Stuttgart'* manifest in a very local form but still holds the universal principle, namely *Bencet* or Tongkat Istiwa. Placement *Bencet* in ancient Javanese mosques is not just a technical necessity, but a symbol of the sovereignty of the ulama in determining the time of worship independently from external influences.[4, p. 112]

History records that in the 18th and 19th centuries, there was a tension between the "Istiwa Time" held firmly by traditionalists in pesantren and the "Regional Time" (average time) which was introduced by the Dutch colonial government for the benefit of railway and telegraph administration. The scholars of the archipelago view *Event Time* As *Al-Waqt Al-Haqiqi* (true time) which is theocentric, while colonial time is seen as *Al-Waqt Al-I'tibari* (artificial time) that is anthropocentric.[5, pp. 89–91] This tension suggests that *Stuttgart'* in Indonesia was once at the forefront of the struggle for Muslim identity and cultural sovereignty against forced Western modernity.

3.4 The Reconciliation of the Mechanical Clock and the Sun: The Birth of the *Istiwa'* Clock

Dialectics reached its peak when mechanical clock technology began to enter the archipelago massively. There is a legal debate (*fiqh*) about the validity of following man-made clocks that are often not in harmony with the shadow of the sun. Ahmad Izzuddin noted that Indonesian astronomy experts made a smart move by creating the "Jam Istiwa".[30, pp. 15–20]

The mechanical clock is not accepted raw, but is "Islamized" by being corrected every day. The clock hand is set to 12:00 right when the shadow of the stick is *Stuttgart'* reach the shortest point. This practice can still be found today at the Menara Kudus Mosque or the Gede Kauman Mosque in Yogyakarta. This proves that in Islamic history, technology (mechanical clocks) has always been positioned as a servant of the signs of nature (*Stuttgart'*), not the other way around. The sovereignty of time remains in the hands of the natural laws outlined by God.

3.5 Historical Significance: Fighting Digital "Blindness"

In the contemporary era, history *Stuttgart'* provides an important lesson about science verification. Today, Muslims tend to experience "digital blindness" where they trust mobile apps without understanding their roots in the sky. History *Stuttgart'* reminds that the shadow method is a system *Fail-safe* (secure backup) is the most accurate. Events *Istiwa' A'ẓam* or

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Rashdul Qiblah, for example, remains the most democratic method of Qibla direction verification because it can be done by anyone without the help of satellites.[31, p. 142]

In conclusion, *the istiwa'* dialectic is a journey from mere astronomical observation to the formation of a social order that is disciplined, culturally sovereign, and remains humble in the face of the order of the cosmos created by Allah Swt.

4. Socio-Historical Analysis

The phenomenon of *istiwa'* has long and cross-civilizational roots, showing that Islamic astronomical knowledge was not born in isolation, but rather was rooted in the scientific traditions of the ancient world. Before Islam came along, the Egyptians and Babylonians had developed the practice of observing the sun through the use of gnomons, a simple instrument that served to measure the length of shadows. Through the observation of these shadows, they can determine the time of day and geographical direction with a high level of accuracy for the size of the era. The fact that gnomons were used in the construction of Egyptian obelisks shows the connection between astronomical observation and religious symbolism, where science and spirituality are not seen as separate entities. This tradition became a conceptual foundation that indirectly influenced the development of *istiwa'* theory in Islam, which was later Islamized in the framework of monotheistic cosmology.

Ancient Greek civilization became the link between Ancient Eastern astronomy and the Islamic world. Figures such as Anaximander and Eratosthenes made the gnomon not only a measuring tool, but also a scientific instrument for developing geometric astronomy. The use of the difference in the length of the sun's shadow to calculate the circumference of the earth suggests that the concept of *istiwa'* had undergone mathematical elaboration long before its integration into Islamic astronomy. This Greek innovation not only increased the accuracy of observations, but also expanded the function of *istiwa'* measurements to be the basis for understanding the structure of the earth and sky. In this context, *istiwa'* transformed from a mere visual phenomenon to a measurable scientific phenomenon, forming the basis for the time and space system that would later become central to Islamic astronomical theory.

The process of scientific transmission from Greece to the Islamic world took place through a massive translation movement in Bayt al-Ḥikmah, Baghdad, during the time of Caliph al-Ma'mun. Works such as Ptolemy's Almagest and Eratosthenes' theories were translated and reviewed in Arabic, then reinterpreted within the framework of Islamic epistemology. This is where there is a reorientation of meaning towards astronomical

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observation: from profane knowledge to sacred knowledge that functions as *āyah kauniyyah*, a sign of God's greatness in the universe. Thus, *istiwa'* in Islam is not only the result of technological adaptation from Greece, but also the theological transformation from empirical science to a science that functions worship. This paradigm shift makes *istiwa'* a symbol of unification between scientific rationality and Islamic spirituality.

In its development, Islamic scholars such as al-Khawārizmī, al-Farghānī, and al-Battānī made great contributions to the systematization of the concept of *istiwa'*. They not only adopted shadow theory from the Greeks, but also developed it through more accurate trigonometric and field observation approaches. Through works such as *Zīj al-Sindhind* and *Kitāb al-Hay'ah*, these scholars transformed the concept of *istiwa'* into a scientific system that could be used to determine the time of prayer and the direction of the qibla. This effort marked the transition from theoretical astronomy to practical astronomy that functioned directly in the lives of the people. Thus, *istiwa'* is no longer just a cosmic phenomenon, but also a worship mechanism that regulates the regularity of human time with the order of the sky.

The culmination of the evolution of the concept of *istiwa'* was seen in the time of al-Bīrūnī, al-Ṭūsī, and Ulugh Beg, when the measurement of the sun's shadow was institutionalized in scientific observatories such as Marāgha and Samarkand. This transformation shows that Islamic astronomy has reached a level of methodological integration between empirical observations, mathematical calculations, and religious principles. The use of giant gnomons in the observatory shows how serious Muslims are in making *istiwa'* a tool for time calibration as well as spiritual reflection. Therefore, it can be concluded that the origin factor of *istiwa'* encompasses intertwined historical, scientific, and theological dimensions: rooted in the Egyptian–Greek tradition, developed through translation in the Islamic world, and refined as a system of time-determination based on revelation and ratio.

The development of the *istiwa'* phenomenon in the falak tradition has undergone a significant transformation since the Islamic Middle Ages, when scholars began to systematically document the event of *Istiwa'* A'ẓam, which is when the sun is directly above the Kaaba so that all the shadows of vertical objects lead to the Qibla is a scientific innovation that strengthens observational methods in determining the direction of the Qibla throughout the Islamic world. This documentation led to the birth of standardized astronomical calibration practices based on natural phenomena, while marking the transition from practical astronomy to more precise applied astronomy. The tradition was then institutionalized through various

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observatories and astronomical centers in the Islamic world, making *istiwa'* a stable scientific reference across the ages. In the modern era, *istiwa'* is still used in determining the time of *Zuhr*, setting the sundial, validating astronomical data, and verifying the results of digital astronomical calculations, showing a long continuity between classical observation and contemporary astronomical technology.

D. Conclusion

From the description above, it can be concluded that the phenomenon of *istiwa'* has a long historical journey, crossing geographical and cultural boundaries from Egypt to Babylon, Greece, to the Islamic world. Scientifically, *istiwa'* represents one of the earliest forms of astronomical observation based on the sun's shadow, which became the forerunner of the development of the time system and spatial orientation. Through the process of intellectual transmission from ancient civilization to Islamic civilization, this concept was not only preserved, but also transformed into a spiritual instrument that played a role in determining the time of worship. Thus, *istiwa'* in Islam is not only a scientific heritage, but also a theological heritage that connects science with divine consciousness.

In addition, the development of the concept of *istiwa'* shows the continuity of science and religion in Islamic history. Scholars such as al-Khawārizmī, al-Farghānī, al-Battānī, and al-Bīrūnī not only continued the scientific heritage of Greece, but also instilled the values of monotheism in the process of observation and measurement. In this case, science plays a role as a medium of *tafaqquh fi al-dīn*, which is a deep understanding of the signs of Allah's greatness through the order of the universe. Thus, the practice of *istiwa'* is not only a scientifically accurate astronomical phenomenon, but also a spiritual manifestation that brings together reason and faith. In other words, the history of *istiwa'* is proof that the integration of science and religion is not a utopian ideal, but a historical reality that has long been realized in Islamic civilization.

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