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Religious Dialogue and Astronomy from the Perspective of Indonesian Muslim Scholars

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Abstract: Dialogue between religion and science is a necessity, because both of them can mutually reinforce the sources of Islamic law. The astronomical approach in the study of hadith makes a significant contribution to the development of astronomy. This article aims to examine the thoughts of an Indonesian Muslim scholar, namely Syamsul Anwar, who offers the concept of the interconnection of astronomy with hadith (especially astronomical hadith). This type of research is a literature by conducting a descriptive analysis of Syamsul Anwar's thoughts. The results of the study show that his contribution to the study of astronomy through an astronomical approach is able to strengthen understanding of the position of a hadith not only from a shari'ah perspective but at the same time being able to explain the meaning of a text using scientific principles (science). The study shows the importance of contextualization and interconnection between Islamic scholarship and other scientific fields. Thus, the efforts that have been made by Syamsul Anwar further strengthen the importance of dialogue between religion and science
Keywords: religious dialogue, hadith, Islamic astronomy, Muslim Scholars

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Abstrak: *Dialog agama dan ilmu pengetahuan (sains) merupakan keniscayaan, karena keduanya dapat saling menguatkan sumber hukum Islam. Pendekatan astronomis dalam kajian hadis memberikan sumbangan signifikan dalam pengembangan Ilmu falak. Artikel ini bertujuan mengkaji pemikiran cendikiawan muslim Indonesia yaitu Syamsul Anwar yang menawarkan konsep interkoneksi astronomi dengan hadits (khususnya hadits astronomi). Jenis penelitian ini adalah kepustakaan dengan melakukan analisis deskriptif terhadap pemikiran Syamsul Anwar. Hasil kajian menunjukkan kontribusi pemikirannya dalam kajian ilmu falak melalui pendekatan astronomi mampu memperkuat pemahaman posisi sebuah hadis yang tidak hanya dari segi syari'at, namun sekaligus mampu menjelaskan makna teks dengan prinsip-prinsip ilmiah (sains). Kajian tersebut menunjukkan pentingnya kontekstualisasi dan interkoneksi antara keilmuan Islam dengan bidang keilmuan lainnya. Dengan demikian, upaya yang telah dilakukan Syamsul Anwar semakin mengukuhkan pentingnya mendialogkan agama dan sains.*
Kata Kunci: *Dialog agama, hadith, astronomi Islam, cendikiawan muslim*

Introduction

The discussion regarding relationship between religion and science has become an ongoing discussion among western scholars as well as among Muslims themselves. Ian G. Barbour's proposal regarding four ways of understanding the relationship between science and religion, namely: conflict, independence, dialogue, and integration, has been widely referred to by subsequent scientists.[1] Although there are those who criticize this typology, such as those carried out by Cantor and Kenny, who consider it too simplistic in seeing the complex and ever-changing historical interactions of science and religion.[2] However, this criticism was responded to again by Barbour in one of his articles and he has explained it in more detail.[3]

[1] See one of the books Barbour wrote in 1990. Ian G Barbour, *Religion in an Age of Science* (Harper & Row San Francisco, 1990); This opinion was referred to by Amin Abdullah and several other thinkers. See: M Amin Abdullah, "Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science," *Al-Jami'ah: Journal of Islamic Studies* 52, no. 1 (2014): 175; The book has also been translated in bahasa. See: Ian G Barbour, *Juru Bicara Tuhan: Antara Sains Dan Agama, Terj, ER Muhammad, Bandung: Mizan*, 2002.

[2] Geoffrey Cantor and Chris Kenny, "Barbour's Fourfold Way: Problems with His Taxonomy of Science-religion Relationships," *Zygon*® 36, no. 4 (2001): 765–81.

[3] Ian G Barbour, "On Typologies for Relating Science and Religion," *Zygon*® 37, no. 2 (2002): 345–60 again in detail about the relationship between religion and science. "Conflict. The view of science and religion is religious absolutism. Independence. Science and religion is the assertion of the cultural relativism of religious traditions. Dialogue. The advocacy of pluralistic dialogue between religions has much in common with the advocacy of dialogue between science and religion. Integration. Integration between religions differs greatly from between science and

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The study of religion and science is one of the most exciting areas of human inquiry. Many colleges, seminars, and universities now offer courses dealing with general themes of science and religion.[4] So that both religion and science will grow.

In understanding the sacred religious texts including the hadiths in them, it is necessary to develop theories, approaches, and methods of interpretation (interpretation) so that the hadith texts become more grounded in the contemporary context. Among the approaches currently being developed by many scholars are integration and interconnection. According to Minhaji, integration comes from the verb *to integrate* born integration nouns and adjectives integrated and integrative. *Inter* is a form prefix that means *between* or *among* (a group). While connect is: *to join, link,* or *unite* which then gives rise to understanding "to think of as related," "to associate in the mind." From here comes the noun in the form of connection and the adjective connected. Based on all of this then the term is known as *an integrated and interconnected approach*.[5]

In line with this opinion, Syamsul Anwar explained that integration refers to the notion of a complete and inseparable unit between one part and another. While interconnection refers to the relationship of two separate things where each stands alone, but is interrelated. The movement of integration into the Islamic sciences means incorporating certain principles into the structure of the Islamic sciences themselves.[6]

There are two separate sides to an integration and interconnection approach. In the integration approach, there is a restructuring of knowledge based on certain principles. This restructuring effort was carried out by changes in paradigms, methods, theories, and other technical procedures. Whereas in the

religion, yet I see some parallels." Compare with writing: Jonathon McPhetres and Thuy vy T. Nguyen, "Using Findings from the Cognitive Science of Religion to Understand Current Conflicts between Religious and Scientific Ideologies," *Religion, Brain and Behavior* 8, no. 4 (2018): 394–405. According to him there are three possibilities to describe the relationship between religion and science. The first is that religion and science exist in independent domains, with each seeking to provide answers to different questions. Second, the possibility that religion and science can complement each other. third is that religion and science are always in conflict.

[4] Alister E McGrath, "Science & Religion: An Introduction," 1999; bandingkan dengan edisi terbaru Alister E McGrath, *Science & Religion: A New Introduction* (John Wiley & Sons, 2020).

[5] Akh Minhaji, *Tradisi Akademik Di Perguruan Tinggi* (Yogyakarta: Suka Press, 2013). 85

[6] Syamsul Anwar, "Integrasi-Interkoneksi Ilmu: Studi Tentang Hukum Bisnis Syariah," *Asy-Syir'ah: Jurnal Ilmu Syari'ah Dan Hukum* 48, no. 2 (2014): 391.

DOI: 10.22373/sjhk.v7i1.12406

interconnection approach, there is no restructuring, but there is an expansion of perspective by absorbing from various other sciences.[7]

In Islamic Studies itself, especially in the field of fiqh proposals, there are three main methods developed: (1) the bayani method (textual), an explanation of a sharia text that is less detailed so it needs clarification. This method can be called a method of interpretation (2) the ta'lili (causation) method, the method of discovering new sharia law because there is no sharia text that is directly related to it, so a new law needs to be found. This method can also be referred to as the argumentation method and (3) the taufiki (synchronization) method, namely the method of finding legal provisions from texts which are inherently contradictory so that a compromise is needed. [8]

The development of the three methods above can be integrated with other scientific disciplines. This article will describe the form of interconnection between the field of Islamic Studies and a scientific approach. Specifically, the focus of the study will describe how the scientific approach is interconnected to the study of hadith as it has been developed by one of the leading Muslim thinkers who is concerned with the field of astronomy (Falak), namely Syamsul Anwar.

Born in Midai, Riau Islands on February 17, 1956. His education started from Madrasah Ibtidaiyah Islamiyah up to the tertiary level, both at home and abroad. In 2004 he was appointed professor at IAIN (now UIN) Sunan Kalijaga. Currently active in Muhammadiyah Central Executive with the position of chairman of the Tarjih and Tajdid Council for the period 2000-2005, 2005-2010, and 2010-2015.[9] After the 48th Muhammadiyah Congress in Solo, he finally agreed to become a member of the Muhammadiyah Central Executive for the 2022-2027 period. In fact, since 1985 until now, he has been active in the Tarjih Council from the regional to the central level.[10] He wrote many works in the fields of Islamic law, hadith and astronomy, and so on.[11]

About the Authenticity of Hadith

Hadith is believed by most Muslims to be the second source of guidance and law after the Koran in the form of words, deeds and agreements of the Prophet

[7] Syamsul Anwar, *Interkoneksi Studi Hadis Dan Astronomi* (Suara Muhammadiyah, 2011). 2

[8] Syamsul Anwar, "Metode Usul Fikih Untuk Kontekstualisasi Pemahaman Hadis-Hadis Rukyat," *Tarjih: Jurnal Tarjih Dan Pengembangan Pemikiran Islam* 11, no. 1 (2013): 113–30.

[9] Rahmadi Wibowo Suwarno, "Pendekatan Interkoneksi Dalam Studi Hadis (Studi Pemikiran Syamsul Anwar)," *Al-Misbah* 5, no. 2 (2017). Al – Misbah 5, No 2. 188

[10] Ilham, "Mengenal Syamsul Anwar, Pakar Hukum Islam Dari Riau," Muhammadiyah.or.id, 2022, https://muhammadiyah.or.id/mengenal-syamsul-anwar-pakar-hukum-islam-dari-riau/.

[11] Syamsul Anwar, "Karya Ilmiah," n.d., https://scholar.google.com/citations?user=xnNBW7sAAAAJ&hl=id&oi.

DOI: 10.22373/sjhk.v7i1.12406

Muhammad.[12] Hadith are usually categorized into four levels based on their quality, namely: sahih, hasan, da'if, and maudhu'.[13]

According to some western scholars, early hadith critics limited or focused more on studying the authentication of a hadith through transmission or isnad only.[14] However, entering the 18th century, the study of hadith continued to develop and became the basic discipline of Islamic scholars with a fairly diverse focus on studying hadith.[15] For example, the study of hadith does not only look at history or its transmission (isnad) to determine its authenticity. According to Syamsul Anwar there are two main elements of a hadith that can be said to be authentic, namely, *sahih* in *sanad* and *shahih* in *matan*.[16]

In addition to strengthening the hadith critique method that had been developed by previous classical hadith experts, he also provided space for modern methods in determining the authenticity of hadith, namely as the criterion analysis carried out by Harald Motzki which was more aimed at the form than the content of al-Musannaf's text. For example, distribution of text, use, and quality of narrators, comparison of *ra'yu* (thinking) and hadith, the existence of personal opinion, comments contrary to the text, uncertainty of the words used by the source, ignorance of the source of law, and so on.[17]

Moztki's study of the authentication of hadith starts from the Kitab al-Musannaf by Abdurrazzaq As-Shan'ani. Motzki succeeded in proving that the hadith of the Prophet had existed since the first century. According to him, the hadith book is an authentic hadith document from the first century of Hijriyah.

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[12] Aisha Y. Musa, *Ḥadīth As Scripture : Discussions on the Authority of Prophetic Traditions in Islam* (New York: Palgrave Macmillan, 2008), 1; Eshrag Ali Refaee,"Detecting Hadith Authenticity Using a Deep-Learning Approach," *Scientific Journal of King Faisal University Basic and Applied Sciences* 23, no. 1 (2022): 80–84.

[13] Abdelaali Hassaine, Zeineb Safi, and Ali Jaoua, "Authenticity Detection as a Binary Text Categorization Problem: Application to Hadith Authentication," in *2016 IEEE/ACS 13th International Conference of Computer Systems and Applications (AICCSA)* (IEEE, 2016), 1–7.

[14] Jonathan A C Brown, "How We Know Early Ḥadīth Critics Did Matn Criticism and Why It' s So Hard to Find," *Islamic Law and Society* 15 (2008): 143–84.

[15] John O. Voll, "Hadith Scholars and Tariqahs: An Ulama Group in the 18th Century Haramayn and Their Impact in the Islamic World," *Journal of Asian and African Studies Invites* XV, no. 3–4 (1980).

[16] Sanad authentication criteria include five things: sanad continuity, rawi fairness, rawi corruption, freedom from anomalies (syuzuz), and freedom from hidden defects (ilat). While matan authentication includes two things, namely formal criteria and substantial criteria. The formal criterion of being free from syuzuz consists of three elements, free from conflict, free from contamination, and free from error. Meanwhile, freedom from ilat includes elements of freedom from internal contradictions and freedom from interpretations of matan. Meanwhile, the criterion for the substance of the authenticity of matan is free from incoherence. See: Anwar, *Interkoneksi Studi Hadis Dan Astronomi*. 27 - 33

[17] Anwar.

DOI: 10.22373/sjhk.v7i1.12406

This is at the same time clear evidence that Islamic law has developed since that time. The results of these findings invalidate Goldziher's theory. and Schacht's common link which states the existence of a sanad system starting in the 2nd century.[18] Although Motzki's opinion was later refuted by Gledhill[19]. But not long after that, through a short article, Motzki responded and strengthened his argument again.[20]

Returning to the above issue regarding the authenticity of a hadith as well as the method used by Syamsul Anwar, namely by making room for the modern (western) method as developed by Motzki. It should be underlined from what Syamsul Anwar has done in relation to the development of Islamic studies (in this context is the science of hadith) he opens up space openly for interconnection between scientific disciplines, where this is one of the foundations of the product of his thoughts including in answering problems. regarding astronomical hadiths as well as the development of studies on hadiths that are currently developing.

Recent studies in studying the authenticity of a hadith are also carried out through various approaches, one of which is by utilizing the development of knowledge and technology, such as the use of the hyper rectangle method, which has succeeded in distinguishing between authentic and inauthentic hadiths.[21] The use of Sentiment Analysis and Machine Learning techniques in predicting the authenticity of a hadith.[22] And the use of a deep-learning approach to detect the authenticity of a hadith.[23]

Several hadith studies conducted using the approach of using technology to see the authenticity of a hadith show quite rapid developments in the hadith study itself. This means that the linkages between various scientific disciplines really need each other so that they can be connected to each other to continue

[18] M. Rofiq Junaidi, "Otentitas Hadis Menurut Harald Motzki," *Al A'raf : Jurnal Pemikiran Islam Dan Filsafat* XII, no. 1 (2015): 59–76; Shohibul Adib, "Pemikiran Harald Motzki Tentang Hadis (Telaah Metodologi Penelitian Harald Motzki Terhadap Kitab Al-Musannaf Karya Abdurrazzaq As-San'ani)," *An-Nidzam* 4, no. 1 (2017): 103–25, https://doi.org/10.33507/an-nidzam.v4i1.27; Ruhama Wazna, "Metode Kontemporer Menggali Otentisitas Hadis (Kajian Pemikiran Harald Motzki)," *Jurnal Ilmiah Ilmu Ushuluddin* 17, no. 2 (2018): 112.

[19] P J Gledhill, "Motzki's Forger: The Corpus of the Follower ʿAṭāʾ in Two Early 3rd/9th-Century Ḥadīth Compendia," *Islamic Law and Society* 19, no. 1–2 (2012): 160–93.

[20] Harald Motzki, "Motzki's Reliable Transmitter: A Short Answer to P. Gledhill," *Islamic Law and Society* 19 (2012): 194–99.

[21] Hassaine, Safi, and Jaoua, "Authenticity Detection as a Binary Text Categorization Problem: Application to Hadith Authentication."

[22] Farhana Haque, Anika Hossain Orthy, and Shahnewaz Siddique, "Hadith Authenticity Prediction Using Sentiment Analysis and Machine Learning," in *2020 IEEE 14th International Conference on Application of Information and Communication Technologies (AICT)* (IEEE, 2020), 1–6.

[23] Refaee, "Detecting Hadith Authenticity Using a Deep-Learning Approach."

DOI: 10.22373/sjhk.v7i1.12406

dialogue and integration as the typological framework that has been developed by Ian G Barbour concerning the relationship between religion and science.

Astronomical Approach to Hadith

The separation between science and religion only strengthens the disharmony between the scientific community and the religious community. This can also have an impact on lagging behind in many sectors of life.[24] So there should be no more dichotomy between science (science) and religion. In this context, the Science of Astronomy can be integrated with the science of hadith, for example. As the approach that has been taken by Syamsul Anwar.

The steps of the astronomical approach to the study of hadiths carried out include: First, collecting hadiths related to the issues discussed, then analyzing them first in terms of the validity of the hadiths, both from the sanad and matan sides including the position of the hadith itself, whether *marfu'* (from the Prophet) or *maukuf* (from a friend). Second, using a historical approach and the opinions of the scholars (fukaha). Third, analyze astronomical data on the studied hadiths (especially those related to astronomy).

By interconnecting different scientific disciplines (between hadith, history, or opinions of jurists and astronomy) it can be used to explain hadith comprehensively and in detail. Even the hadiths whose explanations are still general can be broken down according to scientific rules. So that in general, we do not only know about the position of a hadith (valid or invalid) but can find scientific aspects of the hadith itself. The following describes some examples of hadiths that have been analyzed by Syamsul Anwar through the science of astronomy and the approach of historical science in them.

a. Kuraib Hadith and Matlak Problems

The following reads the translation of the hadith narrated by Kuraib regarding matlak: [25]

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[24] Mohammad Muslih, "Tren Pengembangan Ilmu Di UIN Sunan Kalijaga Yogyakarta," *Epistemé: Jurnal Pengembangan Ilmu Keislaman* 12, no. 1 (2017).107

[25] Matlak comes from the word al-matla' or mathāli which means the place of rising or the place where it appears. Matla' is the place where the sun rises or the place where the sun rises, to be precise, the moon rises, the place where the dawn rises. Matla' is divided into two, namely matla' ikhtilāf (local matla') and matla' ittihād (global matla').Arwin Juli Rakhmadi Butar-Butar, *Problematika Penentuan Awal Bulan: Diskursus Antara Hisab Dan Rukyat* (Malang: Madani, 2014). 129; Matla' is very influential in determining the visibility of the new moon at the altitude (matla'), so that in this case the determination of the beginning of the month for various mass organizations in Indonesia has many differences in determining the beginning of the month of Hijriyah, Shawwal and Zulhijjah. Even the opinions of madzab priests differ, but Indonesia adheres to the Shafi'i madzab in determining matlak. In Indonesia, it is better for every mass organization to discuss its determination, both in terms of the beginning of the month and matla'

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> From Yahya Ibn Yahya Ibn Ayyub, Qutaibah, Ibn Hujr (it is narrated that) Yahya said: had conveyed to us and others said: had informed us (that) Ismail Ibn Ja'far had conveyed a history to us, (that) Isma 'il Ibn Ja'far has conveyed a history to us from Muhammad, namely Abi Harmalah, from Kuraib (who said) that Ummul–Fadl Binti al–Haris sent him to meet Mu'awiyah in Sham. Kuraib explained: I arrived in Syam and took care of Ummul – Fadl needs. When I was in Sham, the month of Ramadan entered and I saw the new moon on Friday night. Then at the end of Ramadan, I arrived back in Medina. Then Ibn 'Abbas asked me and he mentioned the new moon. He asked: when did you see the new moon? I replied: We saw it on Friday night. He asked again: Did you yourself see it? I replied: Yes, and many people saw it too. They fasted the next day and also Mu'awiyah fasted (the next day). Then Ibn Abbas said: But we saw him on Saturday night. Therefore we will continue to fast until even thirty days or until we see the new moon (Shawwal). Then I asked again: Was it not enough for Mu'awiyah's rukyat and fasting? He replied: No! Thus Rasulullah SAW ordered us (Muslims)[26]

In several studies, it is stated that this hadith has become a debate among scholars regarding the issue of matlak. The jurists are divided into two views:

1. Differences in Matlak ikhtilāf do not apply
   If a country sees the new moon, then this applies to all areas on earth. Some scholars are of the opinion, namely Malikiyah, Hanafiyah.
2. Differences (ikhtilāf) Matla' apply
   If another country has seen the new moon, then it does not apply to other countries, but only to the country where the new moon has been seen. Scholars who argue about ikhtilāf are Syafi'iyah and some Hanafiyah.

More clearly, Syamsul Anwar gave several conclusions regarding the hadith issues from Kuraib and regarding the Matlak issue as follows:

1. The hadith narrated from Kuraib, in terms of the chain of transmission of the narrator (Rawi) does not have defects so it is declared valid.
2. There is a difference of opinion among the ulema regarding the majesty of Kuraib's hadith. Some scholars have no doubt that the hadith is Marfuk (nabawi hadith) because it contains a direct order from the Prophet.

(place). Sherly Olyfiya Frifana, "Hadis Matla ' Hilal (Tempat Terbitnya Hilal Dan Tempat Terjadinya Hilal)," *Al - Afaq : Jurnal Ilmu Falak Dan Astronomi* 2, no. 1 (2020): 15–30.

[26] Anwar, *Interkoneksi Studi Hadis Dan Astronomi*. 77; See: Muslim, Sahih Muslim (Beirut: Dar al-Fikr, 1412/1992), II: 484. Hadis no.1087

DOI: 10.22373/sjhk.v7i1.12406

3. Based on astronomical and historical analysis, this hadith is estimated to appear in 35 H.
4. Adhering to the difference in terms of matlak results in the unification of the International Hijri calendar experiencing inconsistency because the age of the month in each region can be different, some are 30 days, and some are only 29 days.[27]

b. Hadith about Islamic Holidays on Friday

In this part of the example, Syamsul Anwar conducts a historical search and an astronomical approach to confirm the hadith which states that at the time of the Prophet Muhammad, there was a day that fell on a Friday. From his research, he can prove it on the basis of the following arguments:

1. Several hadiths that state that the holiday once fell on a Friday are valid and can be justified from the aspect of astronomical analysis even though they were not explained in detail by the Prophet.
2. Based on the astronomical analysis, it is justifiable that there was a holiday that fell on Friday during the time of the Prophet Muhammad, namely during the Eid al-Adha holiday once in the year 8 H coinciding with March 30 630 M. While Eid al-Fitr does not fall on Friday.[28]

He was able to explain in detail the explanation of the hadith above, which is still general in nature and has not been detailed regarding the fall of the feast day on Friday. In fact, Syamsul was also able to explain what is meant by the holiday which falls on Friday, namely Eid al-Adha, not Eid al-Fitr. Through an astronomical approach, the events of the holidays during the time of the Prophet can be explained in full. The following table describes the holidays (Eid al-Fitr and Eid al-Adha) during the time of the Prophet.

Table 1. Eid al-Fitr and Eid al-Adha Calendars

Year	Eid al-Fitr	Eid al-Adha
2 H	Monday, 26-03-624 M	Sunday, 03-06-624 M
3 H	Saturday, 16-03-625 M	Thursday, 23-05-625 M
4 H	Wednesday, 05-03-626 M	Monday, 12-05-626 M
5 H	Monday, 23-02-627 M	Saturday, 02-05-627 M

[27] Anwar, *Interkoneksi Studi Hadis Dan Astronomi*. 115
[28] Anwar.137

DOI: 10.22373/sjhk.v7i1.12406

6 H	Saturday, 13-02-628 M	Thursday, 21-04-628 M
7 H	Wednesday, 01-02-629 M	Monday, 09-04-629 M
8 H	Sunday, 21-01-630 M	**Friday, 29-03-630 M**
9 H	Thursday, 10-01-631 M	Tuesday, 18-03-631 M
10 H	Tuesday, 31-12-631 M	Saturday, 07-03-632 M

Source: Syamsul Anwar, 2011

c. Hadith of Wadak Hajj Departure

Regarding the incident of the Prophet's departure in carrying out the temporary pilgrimage, the scholars devoted their attention to knowing historically the time of his departure, because disagreements still occur. To help solve the above disagreements, Syamsul first presented various views from jurists such as Ibn Muslim (d 195/810), Ibn Hazm (d 456/ 1064), and Ibn al-Qayyim (d. 751/1350) regarding the pilgrimage Rasulullah. After that, it will then be interconnected with astronomical data, then some conclusions will be produced regarding the hadith which tells about the incident of the pilgrimage to the Prophet Muhammad, as follows:

1. The hadith data related to the Wadak Rosulullah Hajj event were analyzed astronomically to produce several conclusions, including The Prophet's departure on the remaining five days of Zulkaidah was the departure from Medina after midday prayers on Saturday 22 February 632 M.
2. By using astronomical analysis, I corrected the previous view (Ibn Hazm) which stated that the Prophet departed from Medina on Thursday, the 6th of Zulkaidah 10 H. This finding also confirmed the view of Ibn al-Qayyim who had previously stated the departure of the Wadak Rasulullah pilgrimage on Saturday 5 remaining Zulkaidah.[29]

d. The Hadith of the Solar Eclipse and the Death of Ibrahim

Regarding the discussion related to the solar eclipse that occurred during the time of the Prophet Muhammad, Syamsul Anwar brought up a discussion that was different from previous researchers. If previously related to this eclipse it was more focused on aspects of religious guidance, such as performing eclipse prayers, but he tried to provide details on when and where the eclipse event occurred. Through an astronomic approach, Syamsul Anwar provides several

[29] Anwar. 155

DOI: 10.22373/sjhk.v7i1.12406

insights related to the solar eclipse, including the event of Ibrahim's death, as follows:

1. Several hadiths that state that there was a solar eclipse at the time of the Prophet can be justified astronomically. During the Prophet's time in Mecca there were 4 solar eclipses, while when the Prophet was in Medina, solar eclipses also occurred 4 times.
2. The solar eclipse during the time of the Prophet coincided with the death of the Prophet's son named Ibrahim on Monday 27 January 632 M (29 Shawwal 10 H). Thus, this astronomical analysis confirms several reports about the age of Ibrahim who died at the age of 1 year and 10 months and at the same time corrects a fairly popular history which states that he died on 10 Robiul Awal 10 H.[30]

Table 2. Solar Eclipses in Mecca and Medina

Mecca	Medina
Monday, July 23 613 M (29 Ramadhan 10 SH)	Thursday, June 21, 624 M (29 Dzulhijjah 2 H)
Friday May, 21, 616 M (29 Syaban 7 SH)	Tuesday April 21, 627 M (29 Zulkaidah 5 H)
Friday Nov, 4 617 M (29 Safar 5 SH)	Monday, Okt 3, 628 M (29 Jumadal Awal 7 H)
Tuesday, Sept 2, 620 M (29 Muharam 2 SH)	Monday, January 27, 632 M (29 Syawal 10 H)

Source: Syamsul Anwar, 2011

e. Hadith about Rukyat

It is undeniable that the Prophet Muhammad through several hadiths ordered Muslims to perform rukyat in determining the beginning of the month of qomariah, especially in months related to worship such as Ramadan, Shawwal, and Zulhijah. At that time there was no problem. However, the context is different when Muslims are expanding to various parts of the world. The use of rukyat is no longer sufficient, it can even cause problems in terms of the timing of the fall of the day of worship. This is because the rukyat does not cover the entire surface of the earth at the time of first visibility.[31] The following are two hadiths about rukyat in determining the beginning of the Islamic month.

[30] Anwar. 180
[31] Anwar, "Metode Usul Fikih."

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صُومُوا لِرُؤْيَتِهِ وَأَفْطِرُوا لِرُؤْيَتِهِ فَإِنْ غُبِّيَ عَلَيْكُمْ فَأَكْمِلُوا عِدَّةَ شَعْبَانَ ثَلَاثِينَ

"Fast when you have seen it (the moon), and open your fast when you have seen it (the new moon of Shawwal). And if it is cloudy for you, then complete the month of Sha'ban to 30 days." (Bukhari and Muslim)

لَا تَصُومُوا حَتَّى تَرَوُا الْهِلَالَ وَلَا تُفْطِرُوا حَتَّى تَرَوْهُ، فَإِنْ أُغْمِيَ عَلَيْكُمْ فَاقْدِرُوالَهُ

"Do not fast until you see the new moon. Do not celebrate Eid until you see the new moon. Then if the hilal is covered with clouds over you, then estimate it." (Bukhari and Muslim)

The two hadiths above clearly show that the Messenger of Allah ordered him to fast and celebrate the new moon when he saw the new moon, there is also a prohibition for Muslims to start it before seeing the new moon. However, the problem is not only the order for the sighting of the new moon and forbidding it from starting (Fasting and Eid al-Fitr) before it has succeeded in surveying. According to Syamsul, it is necessary to pay attention to the context in which the rukyat order was given and also practiced by the Prophet. It should be underlined that during his time the majority of Muslims were still concentrated in the Arabian Peninsula. So the use of rukyat to determine the beginning of the lunar month does not cause problems.[32]

However, the problem arises in the current context where Muslims have inhabited almost all corners of the earth so that the rukyah is no longer sufficient for determining the start of the month of Qomariah. Several problems using the rukyat for determining the beginning of the lunar month, 1) In the month of Zulhijah in certain Hijri years, the use of the rukyat results in not being able to bring down the day of Arafah simultaneously throughout the world 2) It does not allow Muslims to create a unified Islamic calendar system 3) It is not possible to predict the date far ahead, due to the certainty of a new date known the day before the new moon every month.[33]

Faqdurullah, the sentence in the hadith above is interpreted by the followers of reckoning as an approximation, namely by means of reckoning. Meanwhile, for rukyat adherents, the sentence is still mujmal (general) while the hadith with the text, *faakmiluu 'idata sya'ban tsalaatsiina*' is muffasar (clear, detailed). So that which is mujmal must be drawn to the muffasar. Thus, the meaning of faqdurullah in the hadith is istikmal, that is, if the rukyat is not successful, then the number of the month of Sha'ban is completed by 30 days.[34]

[32] Anwar, "Metode Usul Fikih." 120.
[33] Anwar. 124
[34] Zulfiyah, "Studi Ekploratif Hadis Sebagai Sumber Hukum Islam Tentang Ilmu Falak," *Jurnal Al-Mizan* 14, No. 1 (2018): 19–40. 37

DOI: 10.22373/sjhk.v7i1.12406

Syamsul Anwar quotes several statements from prominent scholars, such as Muhammad Rasyid Ridha (d. 1354/1935), Shaykh Ahmad Muhammad Syakir (d. 1377/1958), and Mustafa az-Zarqā (d. 1420/1999), who stated that the rukyat order it was an order that was based on a cause (illat), namely the condition of the people at that time (ummi), did not know writing, reading, and reckoning, so the Prophet ordered a method that was easy to do at that time, namely, rukyat.[35] It was further explained in the Muhammadiyah Hisab Guidebook that currently, Muslims can do calculations, so the 'íllat is no longer valid.[36]

Regardless of whether one of the parties agrees or disagrees, efforts to contextualize ijtihad continue to be pursued, in addition to finding meeting points from differences in views from both parties from circles who fully use reckoning.[37] as well as those who use both but prefer the rukyat method in determining the beginning of the Islamic month. According to Hasballah, et al, legal exploration or ijtihad through the search for 'illat can bring Islamic law more advanced in terms of methodology so that law can help answer problems in society.[38]

Dialogue between Religion and Science

Efforts to dialogue between religion and science as an effort to find common ground between the two can prevent conflicts from occurring. The cognitive aspect in a person according to McPhetres and Nguyen underlies the perspective on the relationship between religion and science.[39] From this point of view, it can be understood that a person's background can influence the way he sees the relationship between religion and science, whether the two are in dialogue with each other or vice versa.

[35] Anwar, "Metode Usul Fikih Untuk Kontekstualisasi Pemahaman Hadis-Hadis Rukyat.", 126

[36] Tim Majelis Tarjih and Tajdid Pimpinan Muhammadiyah, 2009, Pedoman Hisab Muhammadiyah, (Yogyakarta: Majelis Tarjih dan Tajdid Pimpinan Muhammadiyah, 2009). 57.

[37] Some of the foundations of the texts of the Koran which are used as the determination of the use of reckoning include: QS Yunus/10: 5, (QS al-Isra/17: 12). (QS. Yāsin: 39-40). While some hadiths that can be used as a basis for reckoning, one of them is the Hadith of the Prophet. which was narrated by al-Bukhari and Muslim from Abu Hurairah that the Prophet saw. said: "When you want to establish prayer, then complete ablution and then face the qiblah and say takbir." See: Zulfiyah, "Studi Ekploratif Hadis Sebagai Sumber Hukum Islam Tentang Ilmu Falak."

[38] Khairuddin Hasballah et al., "Identifying 'Illat through Munasabah in Islamic Law: A Perspective of Imam Al-Ghazali," *Samarah: Jurnal Hukum Keluarga Dan Hukum Islam* 5, no. 2 (2021): 598–618.

[39] McPhetres and Nguyen, "Using Findings from the Cognitive Science of Religion to Understand Current Conflicts between Religious and Scientific Ideologies." 4

DOI: 10.22373/sjhk.v7i1.12406

Conflicts between science and religion usually arise when scientists make claims that explicitly conflict with theological records or beliefs in religion.[40] When someone is faced with this choice, for example, such as the problem of the origin of creation or related to evolution, most people will still base their views on religion rather than on mainstream science.[41]

Entering the current decade of efforts to avoid conflict between the two, many groups have started to seek synergy, at least since the 1990s.[42] Barbour's Ijtihad resulted in the acceptance of his approach to integrative theological studies. Where religion is in line with the findings of science. Both sides by side to understand each other. Science has a spiritual and transcendental dimension.[43] A scientific paradigm like this is needed today to be able to provide flexibility in building benefits for mankind.[44]

In both the Islamic world and the West itself, the majority view the relationship between religion and science as not contradictory. For example, research conducted by Ecklund, et al. shows that most scientists in the US do not see a conflict between science and religion. This belief does not differ between social and natural scientists.[45] Thus the research shows that only a small number of scientists see religion and science as contradictory.[46]

When there are no more conflicts or conflicts between science and religion, a more peaceful and sustainable world society can grow thanks to the role and collaboration between science and religion.[47] Apart from that, when the two of them can be integrated with each other, they can resolve various tensions that have existed in the past so that both of them can work and be oriented toward the future.[48] In the context of Islam, as a noble religion, the values embodied in

[40] John H Evans, "Epistemological and Moral Conflict between Religion and Science," *Journal for the Scientific Study of Religion* 50, no. 4 (2011): 707–27.

[41] Timothy L O'Brien and Shiri Noy, "Traditional, Modern, and Post-Secular Perspectives on Science and Religion in the United States," *American Sociological Review* 80, no. 1 (2015): 92–115.

[42] Zainul Arifin, "Model-Model Relasi Agama Dan Sains," *Psikoislamika* 5, no. 2 (2008).

[43] Misbah Khoiruddin Zuhri, "Spiritualitas Sains Modern: Pembacaan Terhadap Relasi Agama Dan Sains," *Jurnal Penelitian* 14, no. 2 (2017). 225

[44] Moh Dahlan, "Relasi Sains Modern Dan Sains Islam : Suatu Upaya Pencarian Paradigma Baru," *Salam : Jurnal Ilmu - Ilmu Sosial* 12, no. 2 (2009). 80

[45] Elaine Howard Ecklund and Jerry Z Park, "Conflict between Religion and Science among Academic Scientists?," *Journal for the Scientific Study of Religion* 48, no. 2 (2009): 276–92.

[46] Elaine Howard Ecklund, Jerry Z Park, and Katherine L Sorrell, "Scientists Negotiate Boundaries between Religion and Science," *Journal for the Scientific Study of Religion* 50, no. 3 (2011): 552–69.

[47] K Helmut Reich, "How Could We Get to a More Peaceful and Sustainable Human World Society? The Role of Science and Religion," *Zygon*® 47, no. 2 (2012): 308–21.

[48] Frank T Birtel, "Commentary On The Science-Religion Controversy," *Zygon*® (Wiley Online Library, 1993).424

DOI: 10.22373/sjhk.v7i1.12406

it, both those found in the Koran and hadith, are in harmony with and do not conflict with science.[49]

From the various examples of hadith analysis that have been carried out by Syamsul Anwar through an interconnection approach to science (astronomy), it can provide a more detailed rational view of a past event (hadith) to be more empirical – objective – rational. The interconnection approach as used in studying hadith studies through an astronomical approach is by utilizing data and analysis from various scientific disciplines (science, history, ushul fiqh) into a framework which he calls the 4K term, namely (complementation, confirmation, contribution, and comparison).

Complementation, meaning that the data and knowledge in this study, namely astronomy, are integrated with the science of hadith to strengthen more valid conclusions. Confirmation proves the validity of a hadith which is not only analyzed methodologically by the science of hadith alone but also involves the science of astronomy. Contribution, the science of astronomy can sharpen the findings of hadith science. For example, there is a hadith that, based on the analysis of hadith science, is declared valid, but from the point of view of the matter, it contradicts astronomical findings, so it can be said that the hadith is considered daif. So here the science of astronomy contributes to detecting inaccuracies of a narrator in reporting hadith. Comparison, the results of the analysis of related sciences can be used as comparative material in the analysis of certain sciences in broadening scientific horizons.[50]

A framework that he compiled as an effort to ground the values of the sources of Islamic law contextually by reinterpreting texts that do not rely on a pure textualist model of understanding. So that the interpretation is carried out based on the spirit and purpose of sharia. In short, we can contextualize understanding in a hadith, for example, including those related to the determination at the beginning of the month of Qamariah.[51]

There are at least two concepts offered by Syamsul Anwar in understanding the context of sources of Islamic law. First, through efforts to contextualize Islamic texts (al-Quran, hadith) so that they can always be in accordance with the development of time and place. Second, carry out integration and interconnection by involving various scientific disciplines (for example astronomy) in studying the sources of Islamic law. This framework of thought has now begun to be widely developed among scholars of hadith.

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[49] M Alper Yalçinkaya, "Science,'Religion,' And 'Science-And-Religion' In The Late Ottoman Empire," *Zygon*® 54, no. 4 (2019): 1050–66.

[50] Anwar, *Interkoneksi Studi Hadis Dan Astronomi*. 3 - 4

[51] Syamsul Anwar, "Metode Penetapan Awal Bulan Qamariah," *Journal Analytica Islamica* 1, no. 1 (2012): 32–56.

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Some efforts to contextualize the hadith texts have also been carried out by several other researchers. The difference in understanding of hadith has led to dynamics among scholars, from the classical period to the contemporary era. Including the hadiths which until now there are still many different interpretations of understanding, for example regarding the husband's permission for his wife to leave the house. If the contextualization of the understanding of hadith is carried out, it can be understood that this difference is due to historical-sociological reasons that the condition of society has changed.[52] In line with other research, thus understanding hadiths like this contextually is important so that women are treated fairly and with dignity which in the end can have implications for Islamic law and Islamic teachings.[53]

As for the following studies, the integration of Islamic law into the field of astronomy, for example, is related to the recommendation of rukyat as in the hadith, which cannot be separated from the knowledge that understands natural conditions, so that the order of rukyat can be measured for its success and failure rates.[54] In addition, integration is needed to provide an explanation of the order to face Qibla, for example. So to arrive at a complete understanding of the direction of the Qibla where and how it is, it also needs to be integrated through a geographical approach.[55]

It's still about the integration of science and religion. The author has also used a scientific integration approach, such as in determining the beginning of the month of Ramadan and Hari Raya in Indonesia, so it is necessary to integrate the shari'ah and scientific points of view. The integration of these two paradigms gave birth to the concept of shahadah-'ilmi which can be used to determine the appearance of the new moon (rukyah hilal) at the beginning of Ramadan and Shawwal in Indonesia so that the differences that often occur in determining the first two months can be minimized.[56]

Judging from the various studies that have been carried out as an effort to contextualize and integrate religion and science, it shows that the efforts made by

[52] Tarmizi M. Jakfar and Arifah Fitria, "Understanding Multiple Interpretations on the Hadith That Husbands Allow Wives to Have Outdoor Activities: A Study of Islamic Law Perspectives," *Samarah: Jurnal Hukum Keluarga Dan Hukum Islam* 5, no. 1 (2021): 210–31.

[53] Agusni Yahya and Muslim Zainuddin, "The Interpretation of the Hadith on the Characteristics of Women and Its Implications for Islamic Law," *Samarah: Jurnal Hukum Keluarga Dan Hukum Islam* 5, no. 1 (2021): 276–96.

[54] Machzumy, "Pengaruh Curah Hujan Terhadap Keberhasilan Rukyat Hilal Pada Observatorium Lhoknga Aceh," *Samarah* 3, no. 1 (2019): 238

[55] David A King, "The Culmination of Islamic Sacred Geography," in *Geography and Religious Knowledge in the Medieval World* (De Gruyter, 2021), 179–88.

[56] Muh Arif Royyani et al., "Shahadah'Ilmy; Integrating Fiqh and Astronomy Paradigm in Determining The Arrival of Lunar Months in Indonesia," *AL-IHKAM: Jurnal Hukum & Pranata Sosial* 16, no. 2 (2021): 503–24.

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Syamsul Anwar to dialogue religion and science are in accordance with the spirit of previous studies and have also been developed by other scholars. Including in accordance with the philosophy of developing the scientific framework of higher education. This was also reiterated by Amin Abdullah that the application of the paradigm of dialogue and integration in the Islamic sciences is important to continue to discuss because it has a major influence in shaping religious perspectives. A paradigm of scientific knowledge that integrates and interconnects is needed in religious studies, both now and in the future.[57]

Conclusion

Dialogue between religious reasoning and science through integration and interconnection between scientific fields is urgently needed so that both can continue to develop. In the context of Islamic teachings, the main source texts of Islam (Al-Quran and Hadith) also need to do this, so that the messages contained therein are always *salih li kulli zaman wa makan* (according to time and space) in responding to problems in the current era and which will come.

The scientific approach to Islam has been developed by many Muslim scholars. As has been done by Syamsul Anwar by contextualizing and integrating - interconnection through an astronomical approach (enriched with historical approaches and the opinions of jurists) is able to provide a complete and comprehensive explanation of a hadith study, both from the sanad and matan sides. This is in line with scientific developments which increasingly emphasize the need for an integrated and interconnected approach in the dialogue between Islamic studies and other fields of study.

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[57] Abdullah, "Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science."199

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