

The Validity of Astronomical Calculation in Determining the Lunar Month

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ABSTRACT

Astronomical calculations, in the view of the majority of jurists, rest on mere assumptions and are hypothetical in nature. Therefore, significant acts of worship such as the beginning and end of the month of *Ramadhān* cannot be determined by calculations. The study aimed to validate the astronomical calculation in determining the beginning of new lunar month in connection with Islamic acts of worship. The study utilized descriptive and qualitative research method through in-depth study of printed and internet sources. Results showed that sighting and calculations are complementary and both are needed. Calculations to negate false sighting is used, but not to completely replace sighting. Thus, if the calculations say with certainty that *Hilāl* cannot be visible, then we should reject or negate the false sighting and reduce errors. Since astronomical calculations, especially on the birth of new Moon, are absolutely precise, the claim that a consensus exists among all the *Muslim* jurists regarding absolute mistrust of astronomical calculations, in all forms and ways, related to the beginning and ending of the *Islāmic* months are unfounded, though the majority adopted that opinion because of the uncertainties connected with calculations in their times. Although

calculations alone cannot be used to determine the start of the new lunar month, this does not mean that we should disregard it. It is completely wrong to ignore the information gained through astronomical calculation as this does not, in reality, contradict Islamic teachings. Henceforth, the astronomical calculation is valid in Islam as its prohibitions are merely due to misconceptions.

Keywords — Astronomical calculation, moon sighting, lunar month, qualitative study, Islamic communities

INTRODUCTION

All praise and thanks are due to *Allāh* alone, the One, the All-High, and All-Merciful. Blessings and peace be upon Prophet *Muhammad*, the last of His messengers and prophets, his family, Companions and all those who follow in his footsteps till the end of time.

Islām does not oppress the sound minds, the renewable life, or evolution which is one of the laws of life and nature. It does not oppose any true scientific theory, or any matter decided by the human mind to survive. It does not cancel contemporary systems or scientific progress as long as its foundation rests on *Islāmic* conception, together with the true *Islāmic* application that serve the needs of the present time.

It is true that the *Qur'ān* and the *Sunnah* being the primary sources of *Islāmic* law are fixed and unchangeable. However, it has the inherent capacity to accommodate changes in society. Such ability is realized in the principles of *Ijtihād* being the basis of movement in *Islām*.

There are changeable matters in human life which do not remain and go on as they are exposed to events, calamities, and various times, places and environments. With regard to these matters, *Islām* has a wise stand. It enlightens their different sides. It emphasises and concentrates on the laws which control them, and when they and their proofs are manifested and became clear, *Islām* leaves the parts, the branches, and the secondary matters to the specialists on legislation who know their general and specific meanings, and who understand the time they live in for interpretation and application.¹ What is needed in this sense to confront the challenge of modernity is a comprehensive approach to the law, in its totality.

¹ The Characteristic of Islāmic Thought, p. 27

Astronomical calculations, in the view of the majority of jurists, rest on mere assumptions and are hypothetical in nature. Therefore, significant acts of worship such as the beginning and end of the month of *Ramadhān* cannot be determined by calculations.

In such case, it is proper to consult experts, or the very learned persons to see whether the matter concerned is in accordance with *Islām* and its axioms or not. They are to decide whether to accept or refuse it accordingly. They have to look for solutions to the problems at hand and have to enrich human knowledge.

For instance, in the past, the Prophet [peace and blessings be upon him] together with his companions fought their enemies with swords, spears, and arrows. At present, is it right to put our modern weapons aside and fight the enemies with swords, spears, and arrows?

A true example from *Islāmic* history is that when the companions of the blessed *Muhammad* were fighting their enemy (before the battle of *Yarmūk*) they took their position in lines as they were standing in prayer. But *Khālid ibn al-Walid*, who was asked by the caliph *‘Umar ibn al-Khattāb* to proceed from *Irāq* to *Syria* to take the command of the *Muslim* army, reached the place, came over a hill, and saw that the enemies were divided in squadrons. He directly made a plan, and in the same way, then he fought the Romans and defeated them by the will of *Allāh*. On that glorious day, *Khālid ibn al-Walid* did not fight according to the plan of the lines used by the blessed *Muhammad* and his companion *Abū Bakr*. So, did that change in the military plan cause any harm to *Ibn al-Walid*?

FRAMEWORK

In Islamic parlance, the months are composed of either 29 or 30 days only. This can be ascertained by the practice of the Prophet Muhammad [peace be upon him] of sighting the Hilal on the 29th day of the month. Furthermore, the times of prayers were based on the actual estimation of the sun's position on the horizon.

These are all strongly based in the *Qur’ān* which is full of reflections on the Heaven and Earth. The verses referring to the Creation already contain a broad idea of what is to be found in the heavens, i.e., of everything outside the earth.

Apart from the verses that specifically describe the creation, let us remind ourselves about the relevant verses of the Holy *Qur’ān* on this subject, and we must remember what modern knowledge has to say about the evolution of the stars in general and the Sun in particular, and the celestial bodies that automatically

followed its movement through space, among them the Moon. *Allāh* says:

[And He has made subservient to you, from Himself, all that is in the heavens and on earth; in this behold, there are signs indeed for people who think!]²

[And He has made the sun and the moon, both constantly pursuing their courses, to be of service to you; and He has made the night and the day, to be of service to you.]³

As to secondary rules that change in time, we select what suits our time and get the benefit from jurisprudence, or from the other matters; because wisdom is the aim of the faithful person.

The foregoing principle, is in short, the basis for the use and application of scientific methods for calculating the appearance of the new moon. Thereby giving us a valid framework in trying to validate astronomical calculation in Islam.

The Astronomical New moon

The *Qur'ān* gives an end to the sun for its evolution and a destination place. It also provides the moon with a settled place. To understand the possible meanings of these statements, we must remember what modern knowledge has to say about the evolution of the stars in general and the sun in particular, and the celestial bodies that automatically followed its movement through space, among them the moon.

The *Qur'ān* states:

[The one Who created the night, the day, the sun and the moon. Each one is travelling in an orbit with its own motion.]⁴

The Astronomical New Moon is known as New Moon Birth or Conjunction. It is the moment of time when the earth, sun, and moon are in the same plane. In scientific terms, the Birth of New Moon is the time when sun's ecliptic longitude and moon's ecliptic longitude are the same with reference to the center

² Al-Qur'ān, Sūrat al-Jāthiyah, 45:1

³ Al-Qur'ān, Sūrat Ibrāhīm, 14:33

⁴ Al-Qur'ān, Sūrat Al-Anbiyā', 21:33

of the earth. This could happen at any moment from 0:00 hours to 23:59 hours Universal Time (GMT), and at that moment the moon is dark as seen from the earth. So, you can also think of a “New Moon” as “Dark Moon” or “Invisible Moon.”⁵ At this moment the sunlight falling on the moon cannot come to the earth.

The moon is totally a dark object; it does not have any light of its own. It merely reflects the sunlight falling upon it. When the sun is on the opposite side of the moon, looking from earth, the side of the moon facing earth is completely dark, and we cannot see this moon for about 36 hours every month. On all other days, the moon is at a different angle from the sun and we see different phases of the moon. It rises and sets because of the curvature of the earth as the earth revolves around its own axis.

The astronomical new moon happens when the moon comes between the earth and the sun, and that new moon cannot be seen even by the most sophisticated telescope. That is why it is called the invisible moon because its lighted portion is towards the sun and the dark portion is towards the earth.

SIGHTING AND CALCULATIONS

Muslim astronomers in this age of technology are now in a position to calculate the dates for possible or impossible moon sighting. So the validity of sighting claims can be easily verified for correct moon sighting.

In the matters of confirming or negating the *Islāmic* months, especially the month of *Ramadhān*, it is determined by the sighting of *Hilāl*. The Prophet [peace and blessings be upon him] has said, “Fast at its sighting, and terminate the fast at its sighting.”⁶ This *hadīth* is an explicit proof-text that the month is based on sighting, and not on calculation.

Sighting is required in starting and stopping the acts of worship based upon certainty. According to the majority of the jurists, the sighting of the new moon is required by *Islāmic* Law, as only sighting can guarantee certainty. Actual sighting, in the view of these scholars, seems to be the goal and not the means. Sighting means the actual sighting of the moon with the naked human eyes.

The reason for starting the months with the actual sighting, according to *Hanafī* jurist *Abū Bakr ibn ‘Alī ar-Rāzī al-Jassās*, is to begin the acts of worship with certainty and not base them upon mere probabilities.⁷

5 www.moonsighting.org

6 *Al-Bukhārī* and *Muslim*

7 ‘*Umdat al-Qārī*, vol. 1, p.279

Muhammad ibn ‘Abdullāh al-Kharshī presented the *Mālikī* position in the following words: “The fasting cannot be observed by following the statement of a stargazer. Neither the stargazer nor any one else can fast based upon that because the Prophet [peace and blessings be upon him] has confined the fasting solely to the sighting of the witnesses or completing the 30 days. No other method is prescribed. Therefore, no attention should be paid to the statement or calculations of the stargazer regarding the month whether one believes in the preciseness of his calculations or not.”⁸

The *Shāfi‘ī* jurist *Shihābuddīn ibn Ahmad ar-Ramli* argued that: The Prophet [peace and blessings be upon him] did not depend upon calculations at all but absolutely negated it by his statement that “*we are an unlettered nation, we neither write nor calculate.*” *Ibn ad-Da‘iq al-Ēid* stated that calculations could not be the source of confirming the fasting (of *Ramadhān*).⁹

Abdul Rahim ibn al-Husayn al-Īrāqī, a renowned *Shāfi‘ī* scholar, contended that clouds are very often in the horizon. The *Shar‘ī* reason for fasting is the actual sighting. The majority of jurists connected the fasting with actual sighting without resorting to any other method. This was the opinion of *Mālik*, *Shāfi‘ī*, *Abū Hanīfah*, and the majority of scholars in the past and the present.¹⁰

One of the main reasons for such a total rejection, in the view of these scholars, was the close connection between stargazing (astrology) and magic, which is forbidden by the Prophet of *Islām* [peace and blessings be upon him]. *Al-Hāfiz ibn Hajar* strictly prohibited the use of calculation by quoting the Prophetic sayings that warn *Muslims* about the evils of stargazing such as “*no one would learn any part of stargazing except that he has learned a part of magic.*” Caliph *‘Umar* has been quoted as saying “*Learn from stargazing whatever portion is helpful in guiding you through the land and ocean and then stop.*” Therefore, any part of stargazing other than the directional symbols and signs, to *Ibn Hajar*, was un-*Islāmic*.¹¹

The renowned *Hanbalī* authority *Imām Ibn Taymiyyah* was the staunch opponent of using stargazing calculations to confirm or negate the *Islāmic* months. He emphatically argued that calculations could never lead to a certain method of finding out the crescent and he, like *al-Īrāqī* and *al-Jassās*, also claimed agreement among the scholars about this matter.

8 Sharh Mukhtasar al-Khalīl, Vol. 2, p. 237

9 Sharh ‘Umdat al-Ahkām, Vol. 2, p. 59

10 Tarh at-Tathrib, Vol. 4, pp. 113-114

11 At-Talkhīs, Vol. 2, p. 360

In spite of this overwhelming majority, there have always been voices of dissent among the three schools of thought, except the *Hanbali* School. Known authorities in the *Hanafi*, *Mālikī*, and *Shāfi'ī* schools have argued against the total rejection of calculations in establishing the commencement of *Ramadhān*, etc. It is only the *Hanbali* School of *fiqh*, especially in the classical period that seems to be enjoying a kind of consensus regarding the absolute rejection of calculations.

The claim that actual sighting or completion is the only method accepted by the entire *Ummah* is not based upon historical facts.

A minute minority among the earlier jurists disagree with the notion of complete dismissal of astronomical calculations. They, in opposition to the established opinion, argue that calculations are a definitive way of knowing the movements of celestial bodies and are more certain than just sighting the moon with naked human eyes. This group does not see any prohibition, either in the *Qur'ān* or *Sunnah*, manifestly banning usage of calculations in matters of religion. They find support for their arguments within the *Qur'ān* and the *Sunnah*, in addition to resorting to scientifically logical arguments.

The Prophet [peace and blessings be upon him] emphasized so much upon sighting the new moon not because sighting is the objective of fasting or in any way a goal of the *'Ibādāt*, but because it was a means to ascertain the presence of the new moon, the knowledge of its presence is the objective of *'Ibādāt*.

If the objective can be achieved through a more authentic and precise method (that is, astronomical calculations) then replacing actual sighting, which is a probable mean of certainty, with a more accurate method is based on categorical certainty will not be a deviation from the Prophetic commandment or objectives of *Islāmic Shari'ah*, but will complement them.

There are *two main groups* in this category of scholars as follows:

The *first group* accepts astronomical calculations only in negating the beginning of the month. That is, if the calculations prove it impossible to sight the new moon or negate the birth of the new moon, then they do not accept witnesses who claim the actual sighting even if the witnesses are trustworthy and righteous *Muslims*. This is an old trend among scholars and can be traced back all the way to the first century of *Hijrah*. *Mutarrif ibn 'Abdullāh* (a Successor, *Tābi'ī*), *Abū al-Abbās Ahmad ibn 'Umar ibn Surayj*, and *Taqī ad-Din 'Alī as-Subkī* from the older times and contemporary scholars like *Sheikh Yūsuf al-Qardhāwī*, Director of the *Sunnah* and *Sīrah* Research Center, University of *Qatar*, and many others have championed this position.

The *second group* accepts astronomical calculations both in establishing the beginning of the month as well as negating or dismissing any claim of sighting if the calculations prove otherwise. This is a recent phenomenon among recent scholars of the last century and contemporary scholars such as Dr. *Muhammad Mustafā al-Marāghī*, Grand *Imām of Al-Az'har* 1935–1945; the celebrated Egyptian and encyclopedic authority and 1984 King *Faisal* International Prize-winner *Sheikh Mahmūd Shākir* (1909–1997); *Sheikh Mustafā az-Zarqā'* (1901–1999); the Syrian-born judge, broadcaster, author, editor, teacher, orator, and 1990 King *Faisal* International Prize-winner *Sheikh 'Alī at-Tantāwī* (1908–1999); the contemporary Jordanian jurist Dr. *Sharaf al-Qūdāh*; and many others.

VALIDITY OF ASTRONOMICAL CALCULATION

The time of conjunction or completely dark Astronomical New Moon can be exactly computed. But the calculations for *Islāmic* Dates should be for the Visible Crescent by naked-eye from the surface of the earth in local *Matlā'*, and not the calculations for the dark invisible astronomical new moon (no moon), which is typically one day before the *Hilāl*. The main criterion for *Hilāl* visibility is the angular separation between the Sun and the Moon at sunset.¹²

The scholars in favor of calculations argued that calculations are a definitive way of knowing the movements of celestial bodies and are more accurate than just sighting the moon with the naked eyes.

A. FROM SCIENTIFIC POINT OF VIEW

The relationship between the *Qur'ān* and science is one of harmony and not of discord. This relationship has not always been the same in any one place or time. For instance, in the Christian world, scientific development was opposed by the authorities in question, on their own initiative and without reference to the authentic Scriptures.

In the case of *Islām*, the attitude towards science was quite different. Nothing could be clearer than the famous *Hadīth* of the Prophet [peace and blessings be upon him], “*Seek for Science, even in China*” or the other *hadīth* which says that the search for knowledge is a strict duty for every *Muslim* man and woman.¹³

The *Qur'ān* in inviting us to cultivate science, it contains many observations on natural phenomena and includes explanatory details which are seen to be in

12 www.Hilalsighting.org/Dr.SalmānShiekh

13 The Bible, The Qur'ān, and Science

total agreement with modern scientific data. The fact that, in these reflections, we can find allusions to data connected with scientific knowledge is surely another of God's gifts whose value must shine out in this age where scientifically based materialistic atheism. Scientific knowledge would seem to be highly conducive to reflection on the existence of God.¹⁴

Today it is known how the celestial organisation is balanced by the position of stars in a defined orbit and the interplay of gravitational forces related to their mass and speed of movement, each with its own motion. But this is not what the *Qur'ān* describes, in terms which have only become comprehensible in our own day, when it mentions the foundation of this balance in the *Qur'ān*:

*“(God is) the One Who created the night, the day, the sun and the moon. Each one is travelling in an orbit with its own motion.”*¹⁵

The word which expresses this movement carries with it the idea of a motion which comes from any moving body, be it the movement of one's legs as one runs on the ground, or the action of swimming in water. In the case of a celestial body, one is forced to translate it in the original sense, that is, 'to travel with one's own motion'.

The *Qur'ān* states that *Allāh* created specified orbits for the sun and moon so that human beings can know the number of years and the calculations:

*“God is the One Who made the sun a shining glory and the moon as a light and for her ordained mansions so that you might know the number of years and the reckoning (of the time). God created this in truth. He explains the signs in details for people who know.”*¹⁶

The practical angle from which this perfect celestial order is seen is underlined on account of its value as an aid to man's travel on earth and by sea and to his calculation of time. This comment becomes clear when one bears in mind the fact that the *Qur'ān* was originally a preaching addressed to men who only understood the simple language of their everyday lives. This explains the presence of the following reflections:

¹⁴ Ibid.

¹⁵ Al-Qur'ān, Sūrat al-Anbiyā, 21:33

¹⁶ Al-Qur'ān, Sūrat Yūnus, 10:5

*“And He has subjected to you the night and the day, the sun and the moon; the stars are in subjection to His command. Verily in this are signs for people who are wise.”*¹⁷

It is also a historical fact that astronomical calculations and their use in the matters of *dīn* and *‘ibādāt* is nothing new. They have been used long ago to determine the times of the five daily prayers, *sabūr* and *iftār*, and also to determine the direction of the *qiblah*. The jurists since the old times have not only accepted calculations without any problem but have required *Muslims* to learn about them.

Zaynuddin ibn Ibrāhīm ibn Nujaym argued that *Ibn ash-Shihnah* says that the magician and astrologist mentioned in the *hadīth* are the ones who tell about the unseen or claim knowledge of the future. The statement of such a person will not be accepted and approving such claims will constitute an act of disbelief. But calculations of the moons have nothing to do with that. They are based upon precise calculations and are not fortune-telling or things connected with the unseen. Do you not see what *Allāh* says in the *Qur’ān*: [*He prescribed for (the moon) computed stages so that you can learn about the numbers of years and calculations*].¹⁸

Taqī ad-Dīn ‘Alī ibn ‘Abdul Kāfi as-Subkī, put the point in a nutshell: “It cannot be that the *Sharī‘ah* has categorically prohibited the use of astronomical calculations. That is not the case. How could it be while the calculations are being used in the obligatory as well as other matters (of *dīn*)? The oft-quoted *hadīth* mentions writing and calculations. Now, when writing is not forbidden, how could astronomical calculations be?”¹⁹

With regard to the hardship argument, it must be noted that we are living in a time when the entire world has become a small village. In this age of communication, the news gets all over the world not within minutes but within seconds. Therefore, the argument of hardship leveled by *An-Nawāwī* and others loses its ground. In reality, it is the other way around, as Dr. *Al-Qardhāwī* rightly contends.²⁰ *Muslims* all over the globe, and especially in the West, suffer many hardships due to uncertainties connected with actual sighting. Some of them wait till midnight just to start their *Tarāwīh* Prayers or to decide about their *‘Eid* Prayers. There are many hardships for the working class as well as for *Muslim* students. Therefore, dependence upon actual sighting rather than astronomical

17 Al-Qur’ān, Sūrat an-Nahl, 16:12

18 Al-Asbah wa an-Naza’ir, vol. 2, p. 284

19 Fatāwā as-Subkī, vol. 1, p. 211

20 Fatāwā Mu’āsarah, vol. 2, pp. 212-217

calculations is the source of hardships in our times.

The jurists have categorized the knowledge of stars into two categories. First is the calculation of celestial bodies and their movements to determine the beginning of the months. The one who practices this kind of stargazing is called the astronomer. There is no disagreement among the jurists that such an exercise is permitted. It is allowed to learn such science to know the prayer timings and the directions of the *qiblah*. The majority of the jurists (*jumhūr*) are of the opinion that it is obligatory that such knowledge be sought by a number of *Muslims* at all times. *Ibn 'Abidīn* in his *Hāshiyāt* says that “astronomical calculations are *Islāmically* approved.” That is what the *Qur'ān* precisely says: [*the sun and the moon follow meticulous calculations*]. The jurists have allowed depending upon calculations in relation to the timings of the daily prayers as well as directions of the *qiblah*. The astronomical calculations connected with the new moons, lunar and solar eclipses are correct. Almighty God has fixed a system for the celestial bodies, and they always follow that system to the full extent. The same is the four seasons. The aspects of nature that are continuously repeating themselves are categorical in nature. Therefore, they should be relied upon in the matters of prayer timings as well as *qiblah* directions.²¹

Abmad ibn Muhammad al-Hamāwī, the known *Hanafi* jurist, stated the same: “The calculations related to the new moons and eclipses are based upon actual realities and experiments. They do not come under the category of prohibited acts by the Prophet [peace and blessings be upon him]. This argument is substantiated by the fact that the jurists have allowed knowledge of calculations when it comes to knowing the timings of daily prayers and directions of the *qiblah*.”²²

Perhaps these are the reasons that *Mustafā az-Zarqā'* was amazed that a good number of present-day conservative jurists are so adamant about not accepting the astronomical calculations in confirming or negating the month of *Ramadhān* while they are using the same calculations in acts of worship that are far more important in significance as well as frequency, such as daily prayers. The classical jurists were rightfully correct in their stance against these calculations during their times. The science in their times had not reached the levels of authenticity and certainty where it is in our times. They could not have based important acts of worship, such as the fasting of the month of *Ramadhān*, upon calculations that were not 100 percent precise. Are we going to drag their opposition to

21 *Fatāwā Mu'āsarah*, vol. 14, p. 53

22 *Ghamz 'Uyūn al-Basa'er*, vol. 2, p. 66

calculations to the times where the reason they adopted such a view no longer exists? Cause and effect always go hand in hand. If the cause no longer exists, the effect must also go away.²³

Furthermore, the *Muslim Ummah* for many centuries in the past followed the shadow of poles to determine the timings for the *Zuhr* and *Asr* prayers. The Prophet [peace and blessings be upon him] himself ordered *Muslims* to follow the shadow of the sun to determine the prayer timings.

It is a known fact among the jurists that sighting in itself is not a condition for the month of *Ramadhān*, as *Muhammad ibn 'Alī ibn ad-Daqīq al-'Ēid*, the renowned *Shāfi'ī* authority, stated that the actual sighting is not a prerequisite to the fasting. There is agreement (among the jurists) that if someone is imprisoned in the basement and knows, either through completing 30 days or through estimation by following the signs, that the month of *Ramadhān* has started, then he is required to start fasting even if he has neither sighted the moon by himself nor has been informed by the one who sighted it.²⁴

The famous classical *Hanafī* jurist *Sa'duddin Mas'ūd ibn 'Umar at-Taftazānī* stated that all the *Muslim* jurists agree that sighting the new moon is just a means and not the objective in itself. The meanings of the *Qur'ānic* verse (*whoever witnesses the month*) mean being present in the month. Witnessing the month is just a means. The Prophetic statement "*fast by sighting it*" also leads to that. All the *Muslim* jurists agree that actual sighting is not the objective, but the objective is what the sighting proves, and that is the coming of the (new) month.²⁵

Actual sighting with the naked human eye was prescribed by the Prophet [peace and blessings be upon him] as it was the only method available to the *Muslims* of that time to confirm with certainty the beginning or ending of the month. The reason for such a need was also given by the Prophet [peace and blessings be upon him], and that was the unlettered status of the *Ummah* of that time.

Some contemporary *Muslims* argue that *Islāmic* Law has also fixed the means to achieve *Islāmic* goals such as *halāl* and lawful earning is a means to achieve the goal of feeding one's family. A *Muslim* is not permitted to adopt an unlawful means such as stealing to achieve the above goal. Likewise, the objective of procreating cannot be achieved by unlawful means of adultery and fornication.

Feeding the family by unlawful means such as stealing or cheating is *harām* because *Allāh* has clearly prohibited adopting such means in many verses of

23 *Fatāwā*, pp. 157-159

24 *Ihkām al-Ahkām Sharh 'Umdat al-Ahkām*, vol. 2, p. 8

25 *Sharh at-Talwīh 'ala at-Tawdhīh*, vol. 1, p. 401

the *Qurʾān* and through the Prophetic narrations. Likewise, fathering children through unlawful means is prohibited by the *Qurʾān*. [*Do not even come close to adultery*]²⁶ is the *Qurʾānic* dictum. That is why any such means will be prohibited because they are unlawful in themselves. There are different kinds of means mentioned in the *Qurʾān*, such as those in the following verse:

*“Against them make ready your strength to the utmost of your power, including steeds of war, to strike terror into (the hearts of) the enemies, of Allāh and your enemies, and others besides, whom ye may not know, but whom Allāh doth know. Whatever ye shall spend in the Cause of Allāh, shall be repaid unto you, and ye shall not be treated unjustly.”*²⁷

Here *Allāh* clearly mentions horses as one of the means of striking fear in the hearts of the enemies. The Prophet [peace and blessings be upon him] explicitly asked for arrows as a source of power: *“Certainly the might is consisting of archery; certainly the might is archery.”*²⁸

In modern warfare, we would look stupid if we followed the same means of might against the enemies of *Islām*. Those means were good to achieve the aspired goal in those days but are not appropriate for modern warfare. Therefore, adopting the new means of tanks, missiles, and combat aircrafts to achieve the desired goal of power and might will not be *harām* but obligatory to adapt to our times. There is no *Qurʾānic* text that stops the use of such new means, and that is why it is obligatory to use them. Would anyone insist upon using arrows and horses in the battlefield because *Allāh* and His Prophet fixed the means through the authentic *Qurʾānic* and Prophetic texts?

Likewise, astronomical calculations are a means to achieve the aspired goal of certainty. The Prophetic tradition prohibited them because at that time the overwhelming majority of the *Ummah* was unlettered in the matters of sophisticated astronomical calculations. The same was true with the later generations of the *Ummah*. The majority of the classical scholars were absolutely right in rejecting calculations, as they were inaccurate and mostly done by astrologists and magicians.

But astronomical calculations in our time are no longer the work of magicians or fortune-tellers, but the work of bona fide scientists and astronomers who base their knowledge on scientific observations and facts.

Here we are referring to the astronomical calculations to prove the possibility of sighting and not the birth of the new Moon to try to fulfill the *Sunnah* in

26 Al-Qurʾān, Sūrat Al-Isrāʾ, 17:32

27 Al-Qurʾān, Sūrat Al-Anfāl, 8:60

28 Jāmiʾ al-Bayān fi Tafsīr al-Qurʾān, vol. 10, p. 21

letter and spirit. These astronomical calculations are already being used in acts of *Islāmic* worship such as:

Widely Accepted Time Calculations for Sahūr:

Allāh States:

*“And eat and drink until the [first] streak of light of dawn becomes clear to you against the darkness [of night].”*²⁹

This method determines the end of the period of *Sahūr*: This was the method used by Prophet *Muhammad* [peace and blessings be upon him] and the earlier *Muslims* since they did not know how to pre-compute the instant of time when the first streak of light in the morning occurs. The verse defines a particular instant of time, and it is important to adhere to it and not necessarily to the method suggested in the verse. Any other way of establishing that instant, if possible, would be acceptable. In fact, *Muslim* astronomers who did the pioneering work in astronomy did compute and prepare schedules for this instant of time for any day of a year for various places on the earth. These schedules are used by most *Muslims* today. They are using a method different from the one in the Noble *Qur’ān*, but they still satisfy the basic principle in the *Qur’ān* relating to the time for the end of the *Sahūr*.

Accepted Time Calculations For Maghrib:

To determine the time of sunset for breaking fast or to offer *Maghrib* prayer, the Prophet [peace and blessings be upon him] and earlier *Muslims* used to wait and watch the setting of the sun when the sky was clear. They did not know how to compute the time for sunset. Sighting the sunset with the naked eyes was the only way! Of course, in modern times, perhaps no *Muslim* goes out to watch the setting of the sun. Schedules giving distinct times for sunset for any day in a year for various places on the earth are now available and they are almost universally used. Their use of this method different from what the Prophet [peace and blessings be upon him] used is not a violation of the *Sunnah* since the basic principle in the method used by the Prophet [peace and blessings be upon him] is preserved.

Accepted Time Calculations For ‘Asr:

To determine the time for the *‘Asr* prayer, the Prophet [peace be upon him]

²⁹ Al-Qur’ān, Sūrat al-Baqarah, 2:187

used a stick and placed it vertically on the ground. If the length of the shadow of the stick equaled [or exceeded] the length of the stick, it was time for the *ʿAsr* prayer. Nowadays, we do not use a stick, but we use schedules computed by *Muslim* astronomers to know the time for the *ʿAsr* prayer.

The fact that scholars have approved new methods for determining times for different prayers and the time for the end of *Sabūr* shows that, methods different than those used by the Prophet [peace and blessings be upon him] are consistent with the Noble *Qurʾān* and the *Sunnah*, as long as these new methods satisfy the principles which are behind the methods stated in the Noble *Qurʾān* and those used by the Prophet [peace and blessings be upon him].

Calculation of the birth of the new moon does not necessarily mean that the new moon will be seen or can even be seen, therefore we cannot automatically say that the month is in, with the birth of the new moon because the crescent might not rise above the horizon after conjunction (the meeting of the sun and moon on the horizon).

B. FROM THE ISLĀMIC POINT OF VIEW:

The group of scholars permitting the use of astronomical calculations argued that sighting the new moon is not an act of worship in itself. It is a means of achieving the goal of certainty. Now if the goal of certainty can be achieved by a different and more accurate method, then, following such a method will be as *Islāmic* as sighting the moon with the naked eyes. These scholars believed that, currently, astronomical calculations were more precise than the sighting method.

This group quoted the following Prophetic narrations to prove their point:

1. The Prophet [peace and blessings be upon him] mentioned *Ramadhān* and said, “Do not fast until you see the moon and do not break fast until you see it. If it is cloudy, then estimate it.” (*al-Bukhārī*)
2. “The month (sometimes) consists of twenty-nine days. Therefore, do not fast until you see it and do not break the fast until you see it. Calculate it if it is cloudy.” (*ad-Dārimī*)
3. “Do not fast until you see it and do not break the fast until you see it except that if it was cloudy. Calculate about it if it is cloudy.” (*Ibn Hibbān*)

The jurists have given the following three interpretations of these Prophetic narrations. *Imām Ahmad* interpreted the *ahādīth* (sing. *Hadīth*) as demanding the start of *Ramadhān* following the 29th in case it is cloudy. *Mutarriif ibn*

Abdullāh, Ibn Surayj, and Ibn Qutaybah interpreted them as demanding the use of astronomical calculations when the horizon is cloudy. *Mālik, Abū Hanīfah, Shāfi'ī*, and the majority (*jumbūr*) said that one should complete 30 days and then fast. That is, in their opinion, the meanings of estimation mentioned in the *ahādīth*.

Al-Mawsū'ah al-Fiqhiyyah gave this explanation in the article *Ru'yat al-Hilāl*: "This opinion holds astronomical calculations as a genuine method of estimating the stages of the moon. It has been attributed to *Mutarrif ibn 'Abdullāh ibn ashākir* from the successors, *Abū al-'Abbās ibn Surayj* from the *Shāfi'ī* school, and *Ibn Qutaybah* from the *Hadīth* scholars. *Ibn Rushd* has narrated the statement of *Mutarrif* that astronomical calculations can determine the new moon in case of obscurities. He has also narrated that such a view is attributed to *Shāfi'ī* in one of the reports. The known opinion from *Shāfi'ī* is that fasting cannot be observed except through actual moon sighting or the witness of a trustworthy *Muslim*, as the majority of jurists contend.

An-Nawāwī also told us that, linguistically, the word used in the *ahādīth* means estimation or calculations.³⁰

Linguistically and contextually, the word in the above *ahādīth* leads to the meaning of *taqdīr* as *Abū Sulaymān Ahmad ibn Muhammad ibn Ibrāhīm al-Khattābī* preferred: that is, it gives a sense of counting and calculation in case of cloudy weather or lack of visibility. That is why scholars like *Al-Khattābī, Ad-Dāwūdī* and many others took it to mean that if it happens to be cloudy on the 29th of *Sha'bān*, then going with the authentic astronomical calculations is not only permitted but required by the *Sunnah*.

Al-Bājī reported that *Abū 'Abdullāh Muhammad ibn Saīd ad-Dāwūdī az-Zāhirī* had leaned to such a meaning of the *ahādīth*.³¹

Ibn ad-Daqīq al-Ēid reported that some *Mālikī* scholars from *Baghdād* and some leading authorities from the *Shāfi'ī* school had adopted this position especially in regards to the astronomer himself. The astronomer is required to start fasting on the day his calculations determine it to be the first day of *Ramadhān*.³²

Mutarrif was reported to have said that the astronomer must follow his calculations. *Abū al-'Abbās ibn Surayj*, the renowned *Shāfi'ī* scholar of the third *Hijrī* century, took the position that "calculate" is an address to the people who possess the knowledge of calculation and "sighting" is for use by the common *Muslims*.

30 *Al-Majmū' Sharh al-Muhadzab*, vol. 6, p. 276

31 *Al-Muntaqā Sharh al-Muwatta'*, vol. 2, p. 38

32 *Ihkām al-Ahkām Sharh 'Umdat al-Ahkām*, vol. 2, p. 8

For instance, in the famous *hadīth* of the *Dajjāl* (antichrist) in which the Prophet [peace and blessings be upon him] informed the Companions that at the time of the *Dajjāl*, the real time would seem to extend so tremendously that a day, during that period, will be equal to a year, a month, or a week.³³ The Companions asked how to perform the five daily prayers then. In response, the Prophet [peace and blessings be upon him] replied, “*Faḡdurū lahu*,” meaning to calculate for it. There is no way to interpret the phrase as 29 or 30 days or completion. It means to estimate.

Therefore, the interpretation of “*Faḡdurū lahu*” as calculating the month or the stages of the moon is perhaps more appropriate. That is why some known authorities in the three schools of *fiqh* have no problem accepting the astronomical calculations in this matter.

Imām Taqī ad-Dīn as-Subkī, a well-known *Shāfi‘ī* scholar, categorically rejected even the trustworthy witnesses if the authentic astronomical calculations negate the possibility of sighting the moon. He emphatically argued that: “There is another scenario and that is if the astronomical calculations prove it impossible to sight (the moon) and this is known through categorical inferences such as the moon being too close to the sun at the time of sunset, in this case, it is not possible to see it with our human senses because such a sighting is impossible. Now if one person or two or a group of untrustworthy individuals come up with the witness that they have sighted it, their witness must be rejected. This is because the astronomical calculations are precise while human witness and news are hypothetical; the hypothetical cannot contradict something categorical let alone supersede it. For a witness to be accepted it is required that what is being witnessed about is possible *Islāmically* (legally), logically, and sensually. Therefore, if the astronomical calculations prove sighting impossible, it would be impossible to accept any claim of that *Islāmically* because what is being witnessed is not there, and *Islāmic Shari‘ah* does not come up with something self-contradictory and impossible in itself.”³⁴

According to *as-Subkī*, the *Shari‘ah* has not forbidden calculations at all: “It is obligatory upon the ruler not to accept the witness of such people if he knows by himself or through a trustworthy person that the calculations prove the impossibility of actual sighting. He should neither accept such a witness nor give any ruling based upon such a claim. The month should be considered continuing until the otherwise is proven, as the *Shari‘ah* requires. And we do not say that the

33 Sunan Abī Dāwūd, no. 4317

34 *Fatāwā As-Subkī*, vol. 1, p. 209

Shari'ah has abolished the use of astronomical calculations at all.”³⁵

We have no doubt in our mind that the human witness cannot be accepted against accurately precise calculations. But when the calculations are not certain but probable, then weight should be given to the human witness and his capability of sighting such as the strength of vision, etc. In such a case the judge must use his judgment to the best of his ability. The *Shari'ah* would not prefer a probable method over a certain and accurate method.

Ibn Hajar al-Asqalanī reported that *Ibn al-Daḳīq al-Ēid* said that if the astronomical calculations established the fact that the moon is there and can be sighted, but the cloudy weather came between it and sighting it, in this case, the fasting will become obligatory.³⁶ This constitutes a valid *Islāmic* reason to follow the calculations.

Some of our scholars are of the opinion that there is nothing wrong in depending upon the astronomical calculations. *Muhammad ibn Muqātil* used to inquire of astronomers about the calculations and depend upon that if the calculations were agreed upon by a group of astronomers.³⁷

It seems that all the above-quoted jurists supported the use of calculations to negate rather than confirm the month of *Ramadhān* although jurists like *Ibn al-Daḳīq al-Ēid* and *Muhammad ibn Muqātil ar-Rāzī* allowed using calculations even to confirm when the weather was cloudy.

Among contemporary scholars, *Sheikh Mustafā al-Marāghī*, *Sheikh Ālī at-Tantāwī*, *Mahmūd Shākīr*, *Mustafā az-Zarqā*, *Sharaf al-Qūdāh*, and others have argued that modern science has reached such a level of accuracy and preciseness in the matters of astronomical calculations that there is no more need to sight the moon with the naked eye. The *Shari'ah* required sighting when the *Ummah* was mostly unlettered and mostly ignorant in astronomy and other sciences related to attaining accurate calculations. Now once we have reached the level of certainty in such matters, we must go with the calculations in determining the *Islāmic* months without any need to resort to the actual sighting.

The *Arabs* were called illiterate because writing skills were quite lacking among them. *Allāh* Most High has said [*It is He Who has sent among the illiterate a messenger from among themselves*].³⁸ This fact cannot be refuted by the claim that among the *Arabs* there were individuals who could write or calculate because the writing skills were very rare among them. And the reference to calculation

35 Ibid.

36 An-Nihāyah fi Gharīb al-Āthār, vol. 2, p. 360

37 Ghamz 'Uyūn al-Basa'er, vol. 2, p. 65

38 Al-Jumu'ah, 62:2

in the *hadīth* is to astronomical calculations. They did not know much about astronomical calculations except a very negligible portion of it. That is why the Prophet [peace and blessings be upon him] connected the ruling of fasting with actual sighting to avoid causing any hardship to them.³⁹

Therefore, it is an established rule of *Islāmic* jurisprudence that the cause and the effect go hand in hand. Now once the *Ummah* became free of illiteracy and started writing and calculating, the effect must also be modified.

When the *Ummah* has come out of its unlettered status and started writing and calculating, now once the *Ummah* can trust accuracy of the calculations just like their trust in actual sighting or even more, then it has also become obligatory that they follow the authentic calculations only and not the sighting to confirm the month of *Ramadhān*. The only exception will be if the calculations were hard to come by.⁴⁰

Sheikh Mustafā az-Zarqā', after a detailed discussion of the issue, concluded that there is nothing in the *Shari'ah* rules that stop *Muslims* in our times from accepting astronomical calculations: "It is a fact that sighting the new moon is not an act of worship in itself. It is just a mean to know the timings. It was the only means available to the unlettered nation which knew not how to write or calculate. Its unlettered status was the sole reason for dependence upon the actual sighting. This is clear from the text of the Prophetic tradition which is the source of such a ruling. *Islāmically*, what stops us now to depend upon the accurate astronomical calculations which can determine for us quite ahead of time the beginning of the new month? No cloud or fog can obscure our knowledge of the month then except the fog or dust on the intellect."⁴¹

After elaborating a great deal on the subject, Dr. *Yūsuf al-Qardhāwī*, concluded that the *Islāmic* religion that prescribed sighting the moon as a valid method in confirming the month of *Ramadhān* would prefer accepting astronomical calculations as a valid method also because there could always be doubts or mistakes in human sighting but not in the accuracy of the astronomical calculations. Therefore, accepting astronomical calculations is exactly in line with the true spirit of the *Islāmic Shari'ah*. The *Ummah* can be spared countless confusions and problems by following the calculations.

Dr. *Mustafā 'Abdul Bāsīt* concluded that following astronomical calculations was the original intent of the *Islāmic Shari'ah*. The sighting was prescribed for the times when the *Ummah* was incapable of knowing accurate, precise calculations.

39 'Awn al-Ma'būd, Vol. 6

40 Awā'il as-Shuḥūr al-'Arabiyyah, pp. 7-17

41 Fatāwā, pp. 163-164

The rule of sighting must give way to the original rule once the *Ummah* has attained the authentic knowledge of the calculations. The *Islāmic* months must be confirmed by calculations to avoid the problems connected with the actual sighting.

OBJECTIVES OF THE STUDY

The study aimed to validate the astronomical calculation in determining the beginning of new lunar month in connection with Islamic acts of worship. Specifically, it sought to answer the following questions: 1) How valid is astronomical calculation, as the methodology of determining the lunar month, from the scientific and Islamic legal points of view? 2) Based on the different views of Muslim scholars, can the Muslims adopt the astronomical method of determining the beginning and end of the lunar month? To what extent and in what condition can such adoption be done? Furthermore, it provided significant guidelines, limitations or restrictions as to what extent and condition can astronomical calculation can be applied in sighting the new lunar month.

Finally, this study served as the foundation of having a united observation of the Islamic acts of worship such as the Ramadhan or Eid throughout the whole Muslim nations by clarifying the misconceptions regarding the use of astronomical calculation.

METHODOLOGY

Deals on how and where the writer expects to find data and factual information about the study. It involves research design and data gathering.

The study used the descriptive and qualitative research design. Hence, an in-depth study of the published works of Muslim scholars on the problems under investigation was undertaken.

The data gathering procedure was done through an indepth study and reading of available literatures including internet references; utilizing existing records as the major tool.

Content analysis method was also used to determine whether the use of astronomical calculation is valid in Islam. And if so, the same method was utilized to identify the restrictions or limitations as regards its usage.

RESULTS AND DISCUSSION

The start of *Ramadhān* is determined by the sighting of the *Hilāl* or that refers to the bright waxing crescent when it becomes visible to a normal observer by naked-eye. The Prophet [peace and blessings be upon him] has said, “*Fast at its sighting, and terminate the fast at its sighting.*” (*al-Bukhārī* and *Muslim*) This *hadīth* is an explicit proof-text that the month is based on sighting, not on calculation.

The reasoning of the proponents of calculation is hinged on two main arguments:

Firstly, the saying of the Prophet [peace and blessings be upon him], “*Do not fast until you see the Hilāl, and do not break the fast until you have seen it, but if conditions are overcast for you then enumerate for it.*” (*al-Bukhārī*) The proponents of calculation cite the statement, “*then enumerate for it*” as evidence for the permissibility of calculation.

This reasoning, however, is unacceptable on two counts:

1. Assuming that “enumerate” in the above *hadīth* is, in fact, referring to calculation, the *hadīth* would only indicate the permissibility of calculations in overcast conditions.

2. The meaning of “enumerate” is clarified by another narration of the *hadīth*, also extracted by *al-Bukhārī*, as well as by *at-Tirmidzī*, *Abū Dāwūd*, *Ibn Khuzaymah*, *Ibn Hibbān* and *at-Tayālīsī*, “*Then complete the number of (days of) Sha`bān as thirty.*” (*Nasb ar-Rāyah*, 2/437-8) This *hadīth* clarifies beyond doubt that what is meant by “enumerate” in the first narration is to count thirty days, for the first narration is general and imprecise (*mujmal*), whereas the second is explicit (*mubayyan*), clarifying the imprecision in the first. *Ibn Rushd* says, “It is obligatory to refer the *mujmal* to the *mubayyan*, and this is the way of the scholars of *usūl*, without any disagreement.” (*Bidāyat al-Mujtahid*, 1/284)

Secondly, the saying of the Prophet [peace and blessings be upon him], “*We are an unlettered nation; we neither write nor calculate. The month is so-much and so-much (i.e., sometimes 29 days, sometimes 30)*” (*al-Bukhārī*). The proponents of calculations argue that the only reason calculations were not used by the Prophet [peace and blessings be upon him] was that people at that time were illiterate and uneducated. Thus, they reason that since we are now educated and advanced in astronomy, there is no harm in determining the start of *Ramadhān* purely by calculations.

The refutation of this reasoning is as follows:

It is obvious that the Prophetic statement, “*We neither write nor calculate*” is not meant literally, for it has been established that numerous Companions did in fact write, and in the Farewell Pilgrimage, when a *Yamānī* man named *Abū Shah* asked for a written copy of the sermon, the Prophet [peace and blessings be upon him] told the people, “*Write for Abū Shah.*” [*al-Bukhārī* and *Muslim*]. Furthermore, we know that the *Arabs* at the time used to engage in trade, which inevitably requires calculation, and that astronomical knowledge, such as recognition of the phases of the moon, and its waxing and waning, were present even during that time.

In reality, the *hadīth* is merely stating a characteristic of this *ummah*, namely that their means for determining the month is simple, not requiring sophisticated science or education. *Islām* is a universal religion, and its regulations are meant to be equally accessible to all people, scientists as well as non-scientists. The progress of astronomy cannot abrogate the laws of *Islām*, for the religion was completed and perfected in the time of the Prophet [peace and blessings be upon him] himself.

As further reinforcement, it is worth noting that all of the four juristic schools of thought are unanimous on the point that basing the *Islamic* month purely on calculation is invalid. According to the *Hanafī madz’hab* in “*ad-Durr al-Mukhtār*”, “The word of forecasters carries no weight; even if they are *Islāmically* upright “*Sharh al-Ghāyah*” states the same of the *Hanbalī madz’hab*. The *Mālikī* scholars, *Sheikh Khalīl*, states in his “*Mukhtasar*”, that the month is not established by the saying of an astronomer. *Al-Ardabīlī*, the *Shāfi’ī* scholar states in “*Al-Anwar*,” “Fasting does not become obligatory by knowledge of the phases of the moon.”

So as we have already established that calculations alone cannot be used to determine the start of an *Islamic* month, we must at the same time take due notice that *Islām* does not ask us to divorce reason. Now, given that astronomy today can accurately establish the time of birth of the new moon, and the time interval when it is absolutely impossible to see the crescent-moon, there is no harm in using this astronomical basis to reject a claimed sighting which cannot possibly be correct. *As-Shātībī* said, in “*Al-Muwāfaqāt*”, “Anything which is not in keeping with the principles of the *Sharī’ah* or rational concepts is not to be relied upon.” *Ibn Hajar* said, in “*Sharh Nukhbat al-Fikr*”, “Among the associated circumstances by which fabrication (in *hadīth*) can be recognized (things) which detract from the value of the narrator, and (others) which detract

from the value of the narration, such as it is in contradiction to the text of the *Qur'ān*, or mass-narrated *Sunnah*, or decisive *Ijmā'* (consensus of scholars), or clear common sense.”

Hence, if a sighting is reported when it was absolutely impossible for it to have occurred, it will be rejected even if the one reporting it is an upright *Muslim*. Although in that case, we will attribute the error to genuine misjudgment which does not diminish his *Islāmic* uprightness and acceptability as a witness. Verdicts in this vein have been given by the renowned *Shāfi'ī mujtahid*, *Taqi al-Din as-Subkī*, as well as by numerous recent and contemporary scholars, among them *Alī Tantāwi*, *Ahmad Shākir* and *Muhammad Sanbheli*.

The differences above arise from giving priority to different narrations on the matter, based on factors relating to the authenticities of the reports and on different methodologies of *usūl* in reconciling different narrations. These narrations are:

1. *Abū Dāwūd* had reported that the Prophet [peace and blessings be upon him] said, “Fast at its sighting, and terminate fasting at its sighting. But, if (conditions) are overcast for you, then complete thirty (days). But, if two witnesses testify then fast and terminate fasting (as the case may be).”
2. *At-Tirmidzī* has reported that a Bedouin came to the Prophet [peace and blessings be upon him] and said, “I saw the crescent-moon tonight.” The Prophet [peace and blessings be upon him] asked him, “Do you testify that there is no god but Allāh and that Muhammad is His servant and messenger?” He said, “Yes.” The Prophet said, “O Bilāl! Make *adzān* among the people, for they should fast tomorrow.”
3. *Abū Dāwūd* has reported that people were in the last day of *Ramadhān* when two Bedouins stood up and testified to the Prophet [peace and blessings be upon him] that they had seen the crescent-moon, whereupon the Prophet [peace and blessings be upon him] ordered people to break their fast.

Now, since the scholars differ markedly over the question of sighting in one area, the question to resolve is: is it binding to *Muslims* in other areas?

According to the *Shāfi'ī* school, the sighting is not binding beyond 81 kilometers, as stated by both *Rāfi'ī* and *Nawāwī*. The authentic view of the *madz'hab* is that it is binding on a strip of thickness 81km in either direction of the place of the sighting. This strip extends from the North Pole to the South Pole.

The verdicts in the standard classical references for the *Hanafi*, *Mālikī* and *Hanbalī* schools state that one sighting is binding to the whole world. (See *Fat'h al-Qadīr*, *Mukhtasar Khalīl*, and *al-Mughni* respectively)

However, the *Mālikī* scholar, *Ibn Rushd* has cited consensus of the scholars that the obligation of fasting based on a sighting in another area is not observed for places which are very distant from one another, such as Spain and *Arabia*. (*Bidāyat al-Mujtahid*, 1/288) This verdict was also explicitly stated by the *Hanafi* scholars *al-Kasānī*, *az-Zaylā`ī* and *al-Kashmīrī*. *Sheikh Muhammad Burhānuddin Sanbheli* says, “Contemporary scholars, in general, have gone by (the view of different sightings for) different rising-places (of the moon).” (*Qadhāya Fiqhiyyah Mu`asarah*, p. 94)

The primary evidence for a sighting not being binding on distant places is the *hadīth* narrated by *Muslim*, *Abū Dāwūd*, *Tirmidzi* and *Nasā`ī*, in which *Kurayb* traveled to *Syria* and encountered the start of *Ramadhān* there on a Friday. When he returned to *Madīnah*, he informed *Ibn `Abbās* that he had seen the crescent-moon on the night of Friday and that the people in *Syria*, including *Mu`āwiyah*, the governor, had fasted on Friday. *Ibn `Abbās* replied that they (in *Madīnah*) had seen the crescent-moon on Saturday and that they would not stop fasting until they either saw it again or had completed thirty days. *Kurayb* asked, «Will you not suffice with the sighting of *Mu`āwiyah*?» *Ibn `Abbās* replied, «No, that is how the Messenger of *Allāh* [peace and blessings be upon him] commanded us.” This *hadīth* is quite clear in this respect, and although it does not state the limit beyond which a sighting is not binding, this latter issue becomes a matter of *Ijtihād* for the scholars.

As for the argument that following a single sighting worldwide is in the interests of unity, this is weak as the Pious Predecessors themselves differed on the start and end of *Ramadhān* and they are the best of generations. These differences did not cause disunity among them, and so there is no reason why it should at the present. Rather, the disunity seen today arises from other causes, such as ignorance, intolerance and fanaticism. Furthermore, it is not practically possible for *Ramadhān* or *Eid* to coincide exactly for all the *Muslims* since day and nights occur at different times around the globe.

Finally, the issue of calculations was discussed even in the first century of *Hijrah* and has been discussed throughout *Islāmic* history. The majority of the Classical jurists rejected the use of calculations because the calculations were not precise during their times. The calculations were usually connected with astrology and magic. Moreover, due to lack of high speed internet, telephone and other

means of communications, each locality used to go by its local sighting, and the *Ummah* did not suffer because of going with the actual sighting the way we are suffering in our times.

CONCLUSIONS

In the light of the important findings of the study, the researcher concludes the following:

1. Calculations should be used for *Hilāl* visibility, not for Astronomical New Moon (No Moon).
2. Calculations for *Hilāl* visibility have a Zone of Uncertainty and if the western part of our *Matla'* is in this zone, calculations cannot give an answer thus sighting is the only way.
3. We should use Calculations to negate false sighting, but not to completely replace sighting.
4. The claim that a consensus exists among all the *Muslim* jurists regarding absolute mistrust of astronomical calculations, in all forms and ways, related to beginning and ending of the *Islāmic* months are unfounded, though the majority adopted that opinion because of the uncertainties connected with calculations in their times.
5. Modern science has attained such a level of authenticity in the matters of calculations that achieving certainty about the birth, presence, or absence of the moon on the horizon is not hard at all. This scientific method is more trustworthy than the efforts of people to observe the moon with naked human eyes.
6. Once it has been proven that certainty and not the actual sighting is the goal of the *Islāmic Shari'ah*, then wasting our time on the issues of visibility and non-visibility will be a fruitless endeavor.
7. The notion that Astronomy is prohibited in *Islām* is a misconception that emerged some 1200 years ago when Astrology and Astronomy were not considered separate sciences and *‘Ilm an-Nujūm* was encompassing both astronomy and astrology. Now it is clearly understood that astrology is prohibited but astronomy (*‘ilm al-falakiyāt*) is not. Astronomy is the knowledge of movement and position of cosmos (heavenly bodies), while astrology is the effect of the position of those heavenly bodies on human beings. Future is not known to anyone except *Allāh* so astrology is considered *harām* in *Islām*.

Finally, calculations alone cannot be used to determine the start of an *Islāmic* month. However, *Islām* does not ask us to divorce reason. So, given that astronomy today can accurately establish the time of the birth of the new moon, and the time interval when it is absolutely impossible to see that crescent-moon although it is not yet present, there is no harm in using this astronomical basis to reject a claimed sighting which cannot possibly be correct.

Therefore, accepting astronomical calculations in confirming as well as negating the month of *Ramadhān* is in line with the *Sunnah* and in no way or form constitutes any deviation from the spirit of the *Islāmic Shari'ah*. In contrast, it is perhaps the only method available at our disposal which, if applied in spirit, can realize the *Islāmic* goals of authenticity, certainty, and unity.

Allāh Almighty knows best.

TRANSLATIONAL RESEARCH

This research is already on the process of making its debut as a book. This would be combined with another topic to form as a single manuscript regarding the Sighting as a procedural requisite in determining the beginning of the Holy month of Ramadhan among Muslims. This would be of great value and importance to the whole Muslim nation by fostering the initial steps towards united observance of Ramadhan.

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