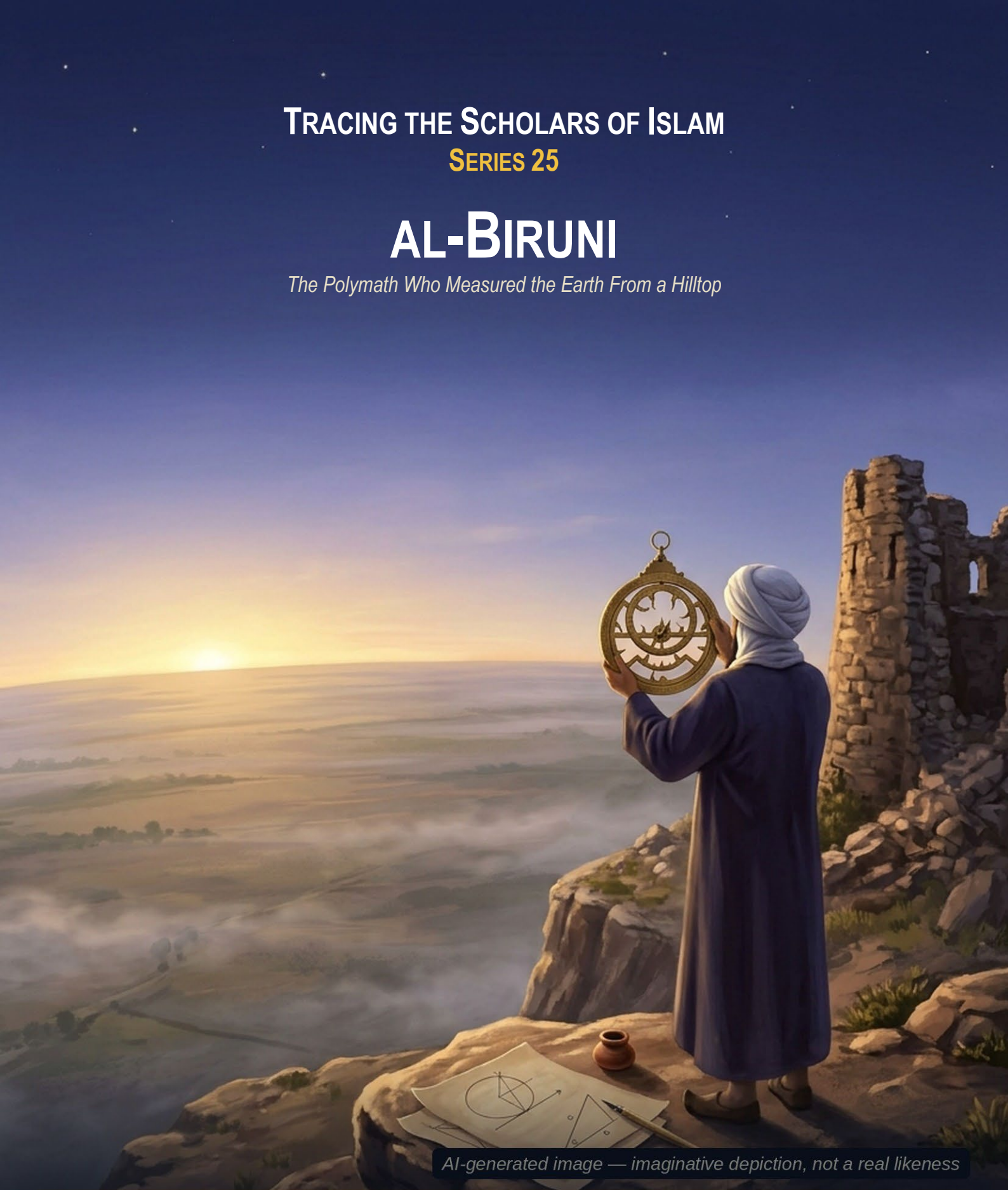
Tracing the Scholars of Islam

Series 25

Al-Biruni

The Polymath Who Measured the Earth From a Hilltop



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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

TRACING THE SCHOLARS OF ISLAM

SERIES 25

AL-BIRUNI

The Polymath Who Measured the Earth From a Hilltop

هُوَ ٱلَّذِي جَعَلَ ٱلشَّمْسَ ضِيَآءً وَٱلْقَمَرَ نُورًا وَقَدَّرَهُۥ مَنَازِلَ لِتَعْلَمُوا۟ عَدَدَ ٱلسِّنِينَ وَٱلْحِسَابَ مَا خَلَقَ ٱللَّهُ ذَٰلِكَ إِلَّا بِٱلْحَقِّ يُفَصِّلُ ٱلْـَٔايَٰتِ لِقَوْمٍ يَعْلَمُونَ

"It is He who made the sun a shining light and the moon a derived light and determined for it phases - that you may know the number of years and account [of time]. Allah has not created this except in truth. He details the signs for a people who know."

SURAH YUNUS 10:5

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ACKNOWLEDGEMENT

All praise is due to Allah, who made the sun a shining light and the moon a derived light, so that we may know the number of years and the account of time. Blessings and peace be upon the Messenger of Allah ﷺ, and upon his family and his Companions.

This eBook is specially dedicated to my beloved wife,

ZAHARAH MOHD LATIF;

my dear children,

MUHAMMAD HAFIZ, NOOR HAZWANI, ABDUL HAKIM, NOOR HIDAYAH, NOR AQILA and **NOR ATIQAH**;

and my sons- and daughters-in-law,

FAZILAH, MALEK, HANIN, FAIRIZAL and **FIRWAN**.

This twenty-fifth book of Tracing the Scholars of Islam tells the story of a scholar who measured the earth from a hilltop, compiled the calendars of the world's nations, and wrote about other peoples with fairness. May his story keep alive in us the love of seeking knowledge until the end of life.

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ABOUT THE COVER OF THIS EBOOK

The cover of this eBook is an **image generated by artificial intelligence (AI)** — an ***imaginative depiction, not a real likeness*** of al-Biruni. This label is also printed on the cover. This time we see him **from behind and slightly above**, on a **rocky hilltop** at dawn — his face is not visible.

Beside him stand the **ruins of an old stone fort**, recalling **Nandana Fort** in the Punjab. He raises a **brass astrolabe** to eye level, sighting towards the distant **horizon** where the misty plain meets the sky. The horizon is drawn ***slightly curved*** — a hint of ***the round earth***.

On a rock lie **sheets of paper with a circle, a tangent line and a triangle**, a **reed pen** and a **clay inkwell** — symbols of the trigonometric method used to ***measure the earth's radius***.

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Colour guide: green box = verses of the Qur'an; gold box = Hadith; brown box = history note (reports from the books of history and biography); blue table = comparison. Underlined blue narrator names can be clicked to open the narrator's page on sunnah.com.

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AL-BIRUNI

The twenty-fifth book of **Tracing the Scholars of Islam** tells the story of ***Abu al-Rayhan Muhammad ibn Ahmad al-Biruni***, a versatile scholar from ***Khwarazm***. He wrote on astronomy, mathematics, geography, calendars, the history of nations, gemstones and medicines.

He is famous for ***measuring the radius of the earth*** from the top of a hill, ***compiling the calendars*** of many nations, and writing a book on ***India*** regarded as one of the most ***fair and careful*** cultural studies of its time.

This eBook also explains ***his correspondence with Ibn Sina***, ***city coordinates and the qiblah***, ***grains on a chessboard***, ***the density of metals***, ***his book of medicines***, and his view of ***a changing earth***.

Note: The translation of Qur'anic verses in this eBook is that of Sahih International. The grading of each Hadith is stated in the Hadith box. Information from books of history and modern research is **biographical narration (not Hadith)** *and is placed in the brown "History Note" boxes. A cover image that shows the scholar is an AI-generated image and is marked as such. His year of death is an estimate.*

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THE SUN, THE MOON AND THE RECKONING OF TIME

SURAH YUNUS 10:5

هُوَ ٱلَّذِى جَعَلَ ٱلشَّمْسَ ضِيَآءً وَٱلْقَمَرَ نُورًا وَقَدَّرَهُۥ مَنَازِلَ لِتَعْلَمُوا۟ عَدَدَ ٱلسِّنِينَ وَٱلْحِسَابَ ۚ مَا خَلَقَ ٱللَّهُ ذَٰلِكَ إِلَّا بِٱلْحَقِّ ۚ يُفَصِّلُ ٱلْـَٔايَٰتِ لِقَوْمٍ يَعْلَمُونَ ۝٥

It is He who made the sun a shining light and the moon a derived light and determined for it phases - that you may know the number of years and account [of time]. Allah has not created this except in truth. He details the signs for a people who know.

Translation: Sahih International — quran.com/10:5

Allah made the sun a shining light and the moon a derived light, and determined its phases ***"that you may know the number of years and account [of time]"***. The science of ***reckoning time*** was one of al-Biruni's main fields. Tafsir Ibn Kathir 10:5.

In his book ***al-Athar al-Baqiya 'an al-Qurun al-Khaliya*** (The Remaining Traces of Past Centuries), he carefully compared the ***calendars and festivals*** of many nations — Arabs, Persians, Jews, Christians, Greeks and others.

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TWELVE MONTHS WITH ALLAH

SURAH AT-TAWBAH 9:36

إِنَّ عِدَّةَ ٱلشُّهُورِ عِندَ ٱللَّهِ ٱثْنَا عَشَرَ شَهْرًا فِى كِتَٰبِ ٱللَّهِ يَوْمَ خَلَقَ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضَ مِنْهَآ أَرْبَعَةٌ حُرُمٌ ۚ ذَٰلِكَ ٱلدِّينُ ٱلْقَيِّمُ ۚ فَلَا تَظْلِمُوا۟ فِيهِنَّ أَنفُسَكُمْ ۚ وَقَٰتِلُوا۟ ٱلْمُشْرِكِينَ كَآفَّةً كَمَا يُقَٰتِلُونَكُمْ كَآفَّةً ۚ وَٱعْلَمُوٓا۟ أَنَّ ٱللَّهَ مَعَ ٱلْمُتَّقِينَ ﴿٣٦﴾

Indeed, the number of months with Allah is twelve [lunar] months in the register of Allah [from] the day He created the heavens and the earth; of these, four are sacred. That is the correct religion, so do not wrong yourselves during them. And fight against the disbelievers collectively as they fight against you collectively. And know that Allah is with the righteous [who fear Him].

Translation: Sahih International — quran.com/9:36

Allah declares that ***"the number of months with Allah is twelve [lunar] months"***, and ***"of these, four are sacred"***. The Hijri calendar, based on the ***moon***, is the calendar of Muslim worship. Tafsir Ibn Kathir 9:36.

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EACH SWIMMING IN AN ORBIT

SURAH AL-ANBIYA' 21:33

وَهُوَ ٱلَّذِى خَلَقَ ٱلَّيۡلَ وَٱلنَّهَارَ وَٱلشَّمۡسَ وَٱلۡقَمَرَۖ كُلٌّ فِى فَلَكٍ يَسۡبَحُونَ ﴿٣٣﴾

And it is He who created the night and the day and the sun and the moon; all [heavenly bodies] in an orbit are swimming.

Translation: Sahih International — quran.com/21:33

Allah created the night and the day, the sun and the moon, ***"all [heavenly bodies] in an orbit are swimming"***. Tafsir Ibn Kathir 21:33.

SURAH YA-SIN 36:40

لَا ٱلشَّمۡسُ يَنۢبَغِى لَهَآ أَن تُدۡرِكَ ٱلۡقَمَرَ وَلَا ٱلَّيۡلُ سَابِقُ ٱلنَّهَارِۚ وَكُلٌّ فِى فَلَكٍ يَسۡبَحُونَ ﴿٤٠﴾

It is not allowable for the sun to reach the moon, nor does the night overtake the day, but each, in an orbit, is swimming.

Translation: Sahih International — quran.com/36:40

This verse declares: ***"It is not allowable for the sun to reach the moon"***. Every heavenly body has its own ***path and decree***. Tafsir Ibn Kathir 36:40.

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HISTORY NOTE: DOES THE EARTH ROTATE?

In ***al-Qanun al-Mas'udi***, al-Biruni discussed the view that ***the earth rotates*** on its axis every day. He stated that astronomical calculations ***remain the same*** whether the earth rotates or the heavens rotate.

In his view, the question belonged to ***natural philosophy***, not mathematics. He also mentioned an ***astrolabe*** designed by ***Abu Sa'id al-Sijzi*** on the assumption that the earth moves.

LESSON

Al-Biruni was ***careful***: he did not reject a view without evidence, nor accept it without evidence. Today we know that the earth does ***rotate once a day*** and ***orbits the sun***.

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BACKGROUND: KHWARAZM AND GHAZNA

Al-Biruni lived when the eastern Islamic world was ruled by several states. ***Khwarazm*** (now in Uzbekistan and Turkmenistan) was a fertile region on the lower ***Amu Darya*** river, known for its merchants and scholars.

> **HISTORY NOTE: THE SAMANIDS AND THE GHAZNAVIDS**
>
> The ***Samanid*** state in Bukhara patronised learning and Persian literature. At their court, ***Ibn Sina*** grew up and studied.
>
> Later the ***Ghaznavid*** state under ***Sultan Mahmud*** (ruled 998–1030 CE) became a great power. Sultan Mahmud gathered scholars in ***Ghazna***, including al-Biruni, and launched campaigns into ***India***.

LESSON

Al-Biruni moved from one court to another, but ***his scholarly work never stopped***. A scholar carries his knowledge wherever he goes.

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WHO WAS AL-BIRUNI?

Al-Biruni was ***born in 973 CE*** on the outskirts of ***Kath***, Khwarazm (now in Uzbekistan). The name "al-Biruni" means "one from outside the city". He studied mathematics and astronomy from a young age, then served at several courts, including that of Qabus in ***Jurjan***.

In ***997 CE***, he observed a ***lunar eclipse*** from Kath, while ***Abu al-Wafa' al-Buzjani*** (Book 23) observed it from Baghdad. The difference in the recorded times allowed them to calculate the ***difference in longitude*** between the two cities.

HISTORY NOTE: TO GHAZNA AND INDIA

In ***1017 CE***, Sultan ***Mahmud of Ghazna*** conquered Khwarazm. Al-Biruni and several other scholars were taken to ***Ghazna*** (now in Afghanistan). From then on he accompanied Sultan Mahmud's campaigns into ***India***.

In India he ***learned Sanskrit***, mixed with local priests and scholars, and gathered material for his book on India. He ***died in Ghazna around 1048 CE***.

REFERENCES:

Wikipedia, "Al-Biruni". https://en.wikipedia.org/wiki/Al-Biruni

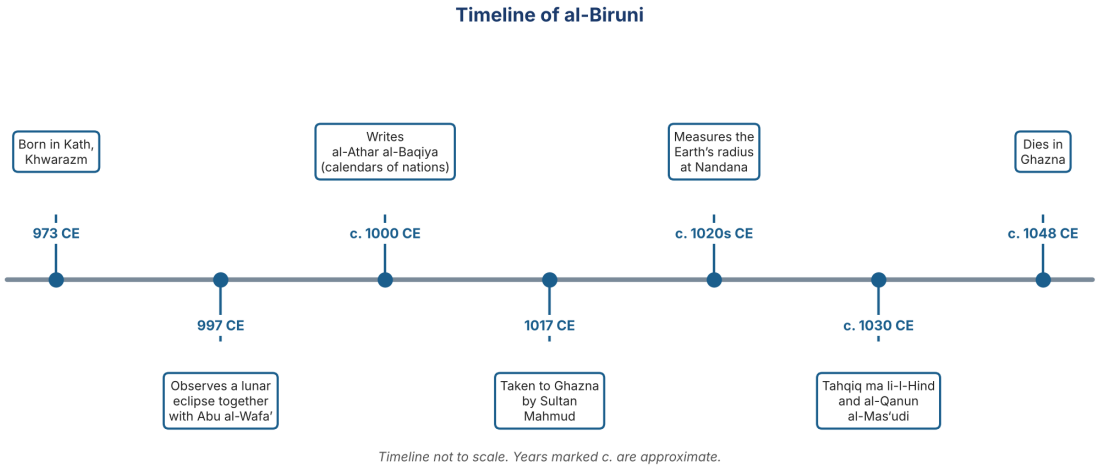


Figure 1: Timeline of al-Biruni.

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MAJOR WORKS

WORK	DESCRIPTION
al-Athar al-Baqiya	Calendars and festivals of many nations (c. 1000 CE).
Tahdid Nihayat al-Amakin	Determining the coordinates of cities; includes the method of measuring the earth.
Tahqiq ma li-l-Hind	A study of the religion, science and customs of India (c. 1030 CE).
al-Qanun al-Mas'udi	An encyclopaedia of astronomy, dedicated to Sultan Mas'ud.
al-Tafhim	An introduction to mathematics and astronomy in question-and-answer form.
al-Jamahir	Gemstones and metals, including their densities.
Kitab al-Saydana	Pharmacology: names of drugs in many languages.

Al-Biruni is said to have written ***more than 140 works***, but only a small part survives.

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QUESTIONS AND ANSWERS WITH IBN SINA

As a young man, al-Biruni ***exchanged letters*** with ***Ibn Sina***, the famous philosopher and physician. These letters are known as ***al-As'ila wa al-Ajwiba*** (Questions and Answers).

> **HISTORY NOTE: A DEBATE BETWEEN TWO YOUNG SCHOLARS**
>
> Al-Biruni sent ***questions*** criticising several of Aristotle's views — on the shape of the heavens, empty space, and the nature of light and heat.
>
> Ibn Sina replied, and al-Biruni answered back. The debate was sometimes ***sharp***, but always based on ***argument***. These letters survive and are studied to this day.

THE ETIQUETTE OF DISAGREEMENT

Two great scholars can ***disagree*** without becoming enemies. Al-Biruni leaned toward ***observation***, Ibn Sina toward ***philosophy***. Both approaches enrich knowledge.

LESSON

Asking is half of knowledge. A good question ***opens the door*** to deeper understanding.

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EXAMPLES OF QUESTIONS IN THEIR LETTERS

QUESTION	FIELD
Why does ice float on water, though it is made of the same substance?	Physics of matter
Can empty space (a vacuum) exist?	Natural philosophy
Why are the heavens considered neither heavy nor light?	Aristotelian astronomy
How does sunlight heat the earth?	Light and heat

The question about ***floating ice*** is fascinating. Today we know that water ***expands*** when it freezes, so ice becomes less dense than water. This unique property preserves ***life in lakes*** during winter.

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THE CALENDARS OF THE NATIONS

In ***al-Athar al-Baqiya***, al-Biruni compiled and compared the calendars of many nations. He explained how each calendar reconciles the ***moon*** with the ***sun***.

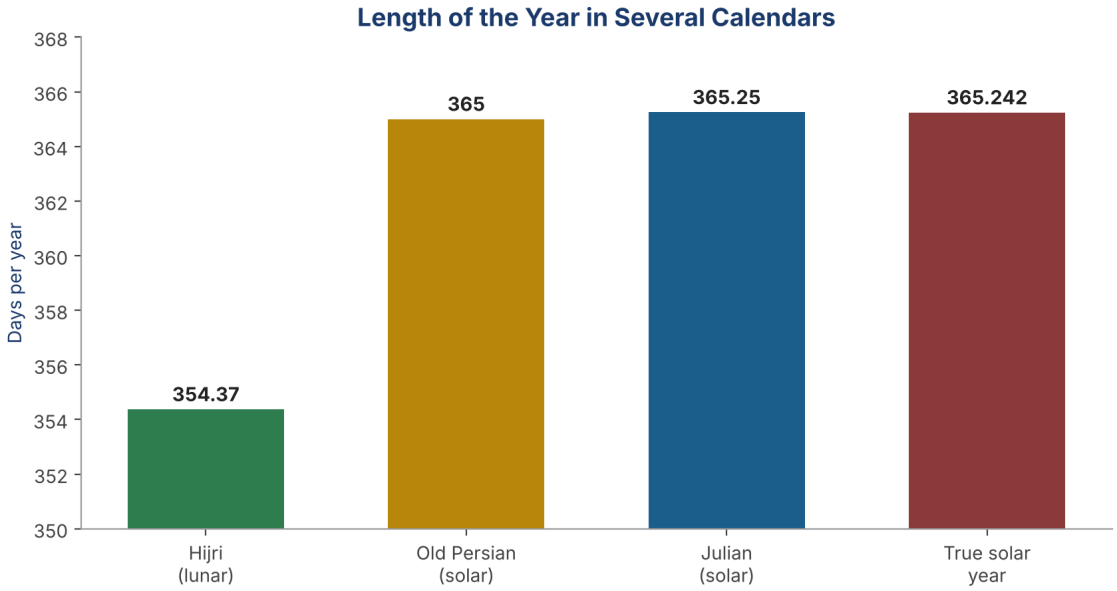


Figure 2: Length of the year in several calendars.

CALENDAR	BASIS
Hijri	Lunar; 12 months, c. 354 days; no added month.
Old Persian	Solar; 365 days.
Jewish	Lunisolar; an extra month is inserted to keep pace with the seasons.
Roman (Julian)	Solar; 365¼ days with leap years.

Al-Biruni explained why ***Ramadan moves*** through all the seasons: the Hijri year is about ***11 days*** shorter than the solar year. The wisdom is that Muslims across the world experience fasting in ***summer and winter*** in turn.

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MEASURING THE EARTH FROM A HILLTOP

Before al-Biruni, scholars measured the earth by ***long journeys*** across the desert. Al-Biruni devised a simpler method: everything was done ***in one place***, a hill near ***Nandana Fort*** in the Punjab (now in Pakistan).

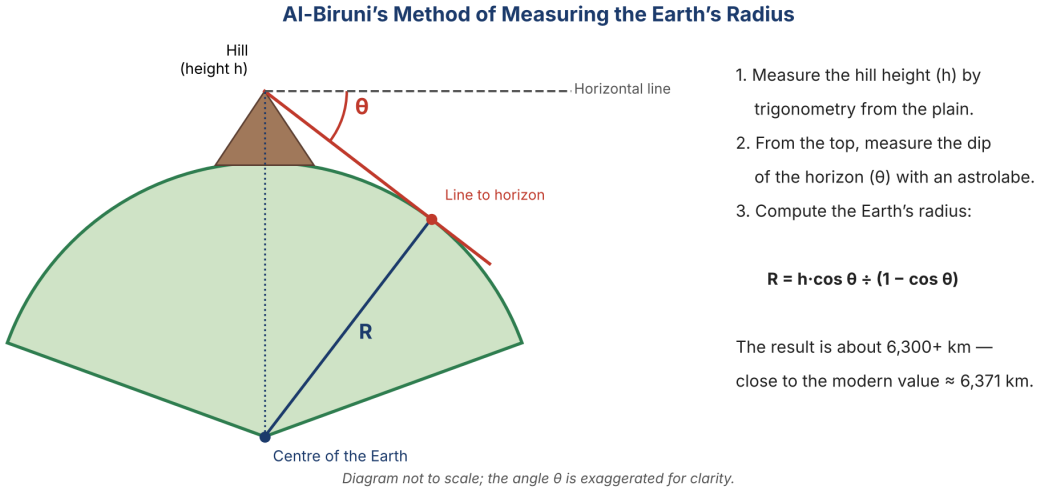


Figure 3: Al-Biruni's method of measuring the earth's radius.

He measured ***the height of the hill*** with trigonometry, then from its top measured ***the dip angle of the horizon*** with an astrolabe. From these two values he calculated ***the earth's radius***. The method is described in his books ***Tahdid Nihayat al-Amakin*** and ***al-Qanun al-Mas'udi***.

HISTORY NOTE: HOW ACCURATE WAS HIS MEASUREMENT?

Al-Biruni recorded his result in ***cubits*** (dhira'). Converted to kilometres, various modern studies give values of about ***6,300 km or more*** — close to the modern value of ***about 6,371 km***. The exact figure depends on the length of the cubit used.

Some researchers stress that its accuracy was ***partly fortunate***, because of atmospheric refraction and the limits of instruments at that time. But ***the method*** itself is clever and is still taught in schools today.

REFERENCES:

Etymological Dictionary of Astronomy and Astrophysics, "Biruni's method". https://dictionary.obspm.fr/terms/birunis-method/

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AL-BIRUNI'S FORMULA

If ***h*** is the height of the hill and ***α*** is the dip angle of the horizon, then the earth's radius ***R = h × cos α ÷ (1 − cos α)***. For example, a hill ***300 m*** high with a dip angle of ***0.556°*** gives a radius of about ***6,370 km***.

The formula needs only ***two measurements*** — something students today can try at the seaside or on a hill, with a precise angle-measuring instrument.

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CITY COORDINATES AND THE QIBLAH

SURAH AL-BAQARAH 2:150

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ ٱلْمَسْجِدِ ٱلْحَرَامِ ۖ وَحَيْثُ مَا كُنتُمْ
فَوَلُّوا۟ وُجُوهَكُمْ شَطْرَهُۥ لِئَلَّا يَكُونَ لِلنَّاسِ عَلَيْكُمْ حُجَّةٌ إِلَّا ٱلَّذِينَ
ظَلَمُوا۟ مِنْهُمْ فَلَا تَخْشَوْهُمْ وَٱخْشَوْنِى وَلِأُتِمَّ نِعْمَتِى عَلَيْكُمْ وَلَعَلَّكُمْ
تَهْتَدُونَ ﴿١٥٠﴾

And from wherever you go out [for prayer], turn your face toward al-Masjid al-Haram. And wherever you [believers] may be, turn your faces toward it in order that the people will not have any argument against you, except for those of them who commit wrong; so fear them not but fear Me. And [it is] so I may complete My favor upon you and that you may be guided.

Translation: Sahih International — quran.com/2:150

Allah commands: ***"from wherever you go out [for prayer], turn your face toward al-Masjid al-Haram"***. Tafsir Ibn Kathir 2:150.

In ***Tahdid Nihayat al-Amakin***, al-Biruni determined the ***latitude and longitude*** of many cities by observation and calculation. One of his aims was to determine ***the qiblah from Ghazna*** precisely using spherical trigonometry.

LESSON

Geography and astronomy are not mere theory — they serve ***worship***. The accurate qiblah in every mosque today is ***a fruit*** of the work of scholars like al-Biruni.

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LAND BEYOND THE OCEAN?

Al-Biruni studied the extent of the land known in his time — from West Africa to China. That land covered only ***a small part*** of the surface of the round earth.

> **HISTORY NOTE: A GEOGRAPHER'S ARGUMENT**
>
> He argued that it was unreasonable for ***most*** of the earth to be empty ocean. So he ***conjectured*** the possible existence of ***inhabited land*** in the unknown parts of the ocean.
>
> Some modern writers link this conjecture to ***the Americas***. But it was ***an argument and a conjecture***, not a discovery or an actual voyage.

LESSON

Good scholarship ***distinguishes*** between what is known for certain and what is still conjecture. Al-Biruni himself stated that it was ***a possibility***, not a certainty.

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GRAINS ON A CHESSBOARD

In ***al-Athar al-Baqiya***, al-Biruni discussed a famous puzzle: put ***one grain of wheat*** on the first square of a chessboard, ***two grains*** on the second, ***four*** on the third, and so on — doubling on every square.

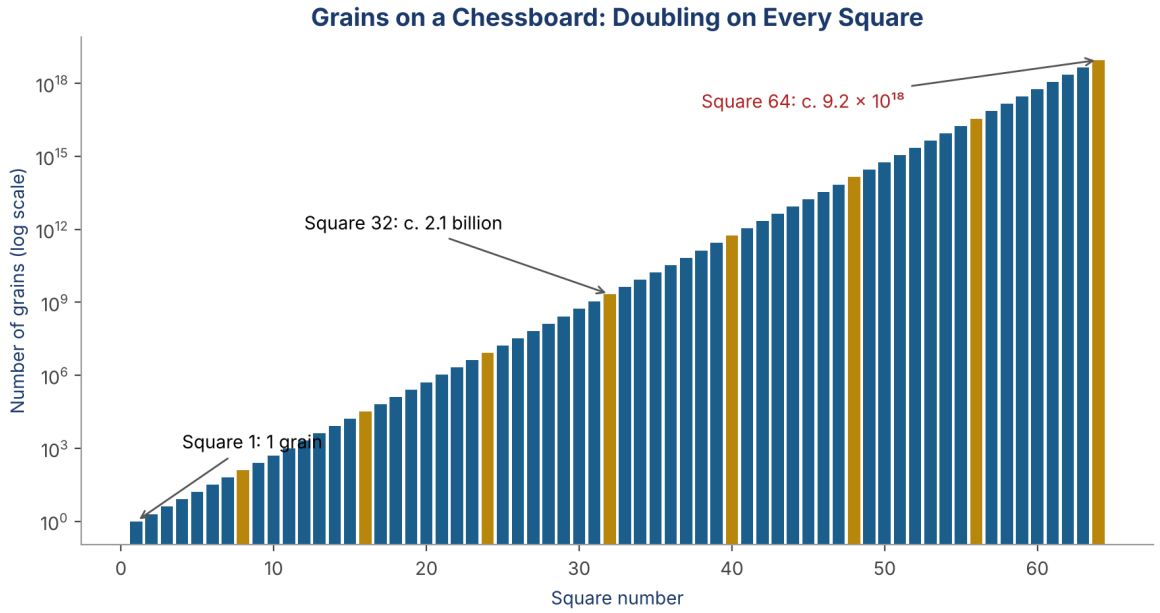


Figure 4: The number of grains doubles on every square.

Al-Biruni calculated the total exactly: ***18,446,744,073,709,551,615*** grains — that is, $2^{64}-1$. This amount far exceeds all the wheat ever grown in the world.

LESSON

Doubling growth is extremely fast. Small good deeds done ***consistently*** can also grow large — and so can small sins that are left unchecked.

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GETTING TO KNOW OTHER PEOPLES

Al-Biruni's book on India, ***Tahqiq ma li-l-Hind*** (completed around 1030 CE), describes the religion, philosophy, science and customs of the Indians. He tried to ***quote from original sources***, and distinguished the views of the learned from the practices of the common people.

SURAH AL-HUJURAT 49:13

يَٰٓأَيُّهَا ٱلنَّاسُ إِنَّا خَلَقۡنَٰكُم مِّن ذَكَرٖ وَأُنثَىٰ وَجَعَلۡنَٰكُمۡ شُعُوبٗا وَقَبَآئِلَ لِتَعَارَفُوٓاْۚ إِنَّ أَكۡرَمَكُمۡ عِندَ ٱللَّهِ أَتۡقَىٰكُمۡۚ إِنَّ ٱللَّهَ عَلِيمٌ خَبِيرٞ ١٣

O mankind, indeed We have created you from male and female and made you peoples and tribes that you may know one another. Indeed, the most noble of you in the sight of Allah is the most righteous of you. Indeed, Allah is Knowing and Acquainted.

Translation: Sahih International — quran.com/49:13

Allah made mankind into peoples and tribes ***"that you may know one another"***. Al-Biruni showed that knowing other peoples ***honestly and fairly*** is part of knowledge — even when we do not share their beliefs. Tafsir Ibn Kathir 49:13.

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THE DIVERSITY OF LANGUAGES AS A SIGN

SURAH AR-RUM 30:22

وَمِنْ ءَايَٰتِهِۦ خَلْقُ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفُ أَلْسِنَتِكُمْ وَأَلْوَٰنِكُمْ ۚ إِنَّ فِى
ذَٰلِكَ لَءَايَٰتٍ لِّلْعَٰلِمِينَ ﴿٢٢﴾

And of His signs is the creation of the heavens and the earth and the diversity of your languages and your colors. Indeed in that are signs for those of knowledge.

Translation: Sahih International — quran.com/30:22

Allah mentions ***"the diversity of your languages and your colors"*** as one of His signs. Al-Biruni mastered ***Arabic, Persian, Khwarazmian and Sanskrit***, and knew some Hebrew and Syriac. Tafsir Ibn Kathir 30:22.

Learning other people's languages is ***the key*** to understanding their knowledge and culture accurately.

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REPORTING HONESTLY AND JUSTLY

Al-Biruni was very careful in ***reporting information***. He distinguished between what he ***saw himself***, what he read in ***the original books***, and what he merely ***heard*** from people. The Messenger of Allah ﷺ said:

HADITH — SAHIH MUSLIM, INTRODUCTION NO. 5 — FROM IMAM MUSLIM'S OWN INTRODUCTION

وَحَدَّثَنَا عُبَيْدُ اللَّهِ بْنُ مُعَاذٍ الْعَنْبَرِيُّ، حَدَّثَنَا أَبِي ح، وَحَدَّثَنَا مُحَمَّدُ بْنُ الْمُثَنَّى، حَدَّثَنَا عَبْدُ الرَّحْمَنِ بْنُ مَهْدِيٍّ، قَالاَ حَدَّثَنَا شُعْبَةُ، عَنْ خُبَيْبِ بْنِ عَبْدِ الرَّحْمَنِ، عَنْ حَفْصِ بْنِ عَاصِمٍ، قَالَ قَالَ رَسُولُ اللَّهِ صلى الله عليه وسلم «كَفَى بِالْمَرْءِ كَذِبًا أَنْ يُحَدِّثَ بِكُلِّ مَا سَمِعَ».

TRANSLATION:

The Messenger of Allah ﷺ said: **"It is enough of a lie for a person to narrate everything he hears."**

CHAIN OF NARRATION: Narrated by Imam Muslim: from 'Ubaydullah ibn Mu'adh al-'Anbari, from his father Mu'adh ibn Mu'adh; and from Muhammad ibn al-Muthanna, from 'Abd ar-Rahman ibn Mahdi, both from Shu'bah, from Khubayb ibn 'Abd ar-Rahman, from Hafs ibn 'Asim. In the following narration, Imam Muslim narrates it with a connected chain: from Abu Bakr ibn Abi Shaybah, from 'Ali ibn Hafs, from Shu'bah, with the same chain, from Hafs ibn 'Asim, from Abu Hurairah رضى الله عنه.

REFERENCE: Narrated by Imam Muslim in the Introduction to Sahih Muslim, Hadith No. 5; the connected narration through Abu Hurairah is in the Introduction, narration 7 (sunnah.com/muslim/introduction/7).

GRADE: SAHIH — Imam Muslim placed it in the Introduction to Sahih Muslim and narrated it with a connected chain through Abu Hurairah رضى الله عنه.

Source: https://sunnah.com/muslim:5

LESSONS FROM THIS HADITH

Relating ***everything*** one hears without checking can make a person ***a spreader of lies***. Al-Biruni checked his sources — an attitude badly needed in the age of social media.

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SURAH AL-MA'IDAH 5:8

يَٰٓأَيُّهَا ٱلَّذِينَ ءَامَنُواْ كُونُواْ قَوَّٰمِينَ لِلَّهِ شُهَدَآءَ بِٱلۡقِسۡطِۖ وَلَا يَجۡرِمَنَّكُمۡ شَنَـَٔانُ قَوۡمٍ عَلَىٰٓ أَلَّا تَعۡدِلُواْۚ ٱعۡدِلُواْ هُوَ أَقۡرَبُ لِلتَّقۡوَىٰۖ وَٱتَّقُواْ ٱللَّهَۚ إِنَّ ٱللَّهَ خَبِيرُۢ بِمَا تَعۡمَلُونَ ٨

O you who have believed, be persistently standing firm for Allah, witnesses in justice, and do not let the hatred of a people prevent you from being just. Be just; that is nearer to righteousness. And fear Allah; indeed, Allah is Acquainted with what you do.

Translation: Sahih International — quran.com/5:8

Allah commands: ***"do not let the hatred of a people prevent you from being just"***. Tafsir Ibn Kathir 5:8.

Although al-Biruni lived during ***wars*** between Ghazna and India, he wrote about the Indians ***fairly***. He praised their knowledge and criticised what needed criticism — without ***hatred***.

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ECLIPSES: TWO SIGNS OF ALLAH

Al-Biruni observed eclipses as ***natural events that can be calculated***, not omens. This attitude agrees with the teaching of the Messenger of Allah ﷺ:

HADITH — SAHIH AL-BUKHARI, NO. 1041

حَدَّثَنَا شِهَابُ بْنُ عَبَّادٍ، حَدَّثَنَا إِبْرَاهِيمُ بْنُ حُمَيْدٍ، عَنْ إِسْمَاعِيلَ، عَنْ قَيْسٍ، قَالَ سَمِعْتُ أَبَا مَسْعُودٍ، يَقُولُ قَالَ النَّبِيُّ صلى الله عليه وسلم «إِنَّ الشَّمْسَ وَالْقَمَرَ لاَ يَنْكَسِفَانِ لِمَوْتِ أَحَدٍ مِنَ النَّاسِ، وَلَكِنَّهُمَا آيَتَانِ مِنْ آيَاتِ اللَّهِ، فَإِذَا رَأَيْتُمُوهُمَا فَقُومُوا فَصَلُّوا».

TRANSLATION:

Abu Mas'ud رضى الله عنه said: The Prophet ﷺ said: "**The sun and the moon do not eclipse because of the death of anyone among the people, but they are two signs among the signs of Allah.** So when you see them (eclipsed), stand up and pray."

CHAIN OF NARRATION: Narrated by Imam al-Bukhari: from Shihab ibn 'Abbad, from Ibrahim ibn Humayd, from Isma'il ibn Abi Khalid, from Qays ibn Abi Hazim, from Abu Mas'ud al-Ansari رضى الله عنه.

REFERENCE: Narrated by Imam al-Bukhari in Sahih al-Bukhari, Book of Eclipses (Kitab al-Kusuf), chapter on prayer during a solar eclipse, Hadith No. 1041.

GRADE: SAHIH — contained in Sahih al-Bukhari, the most authentic book of Hadith after the Qur'an by consensus of the Hadith scholars.

Source: https://sunnah.com/bukhari:1041

LESSONS FROM THIS HADITH

Eclipses ***do not happen because of anyone's death or birth*** — they are ***signs of Allah***. This Hadith rejects superstition, and at the same time calls us to ***pray*** when we see one. Knowledge and worship go hand in hand.

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ECLIPSES IN MODERN SCIENCE

TYPE OF ECLIPSE	HOW IT HAPPENS
Solar eclipse	The moon is between the sun and the earth; the moon's shadow falls on the earth.
Lunar eclipse	The earth is between the sun and the moon; the earth's shadow covers the moon.

Eclipses can be ***calculated precisely*** years in advance (NASA: Eclipses). Al-Biruni and Abu al-Wafa' used the lunar eclipse of 997 CE to calculate the ***longitude difference*** between two cities.

During an eclipse, Muslims are encouraged to perform ***the eclipse prayer***, remember Allah and give charity — responding to a sign of nature with ***worship***, not fear or superstition.

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THE DENSITY OF METALS AND GEMS

In ***al-Jamahir***, al-Biruni measured the ***specific gravity*** of many metals and gemstones — how many times heavier a substance is than the same volume of water. He used a ***conical vessel*** that measured the water displaced.

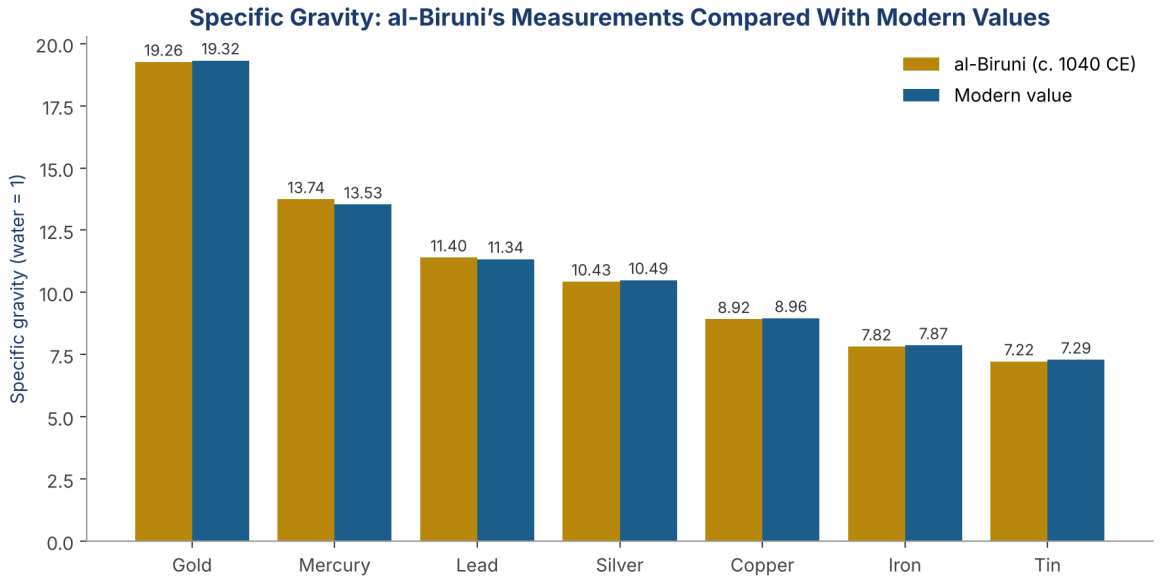


Figure 5: Specific gravity of metals — al-Biruni's measurements compared with modern values.

The values he obtained are ***very close*** to modern values (Wikipedia: Al-Biruni).

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IRON SENT DOWN

SURAH AL-HADID 57:25

لَقَدۡ أَرۡسَلۡنَا رُسُلَنَا بِٱلۡبَيِّنَٰتِ وَأَنزَلۡنَا مَعَهُمُ ٱلۡكِتَٰبَ وَٱلۡمِيزَانَ لِيَقُومَ ٱلنَّاسُ بِٱلۡقِسۡطِۖ وَأَنزَلۡنَا ٱلۡحَدِيدَ فِيهِ بَأۡسٞ شَدِيدٞ وَمَنَٰفِعُ لِلنَّاسِ وَلِيَعۡلَمَ ٱللَّهُ مَن يَنصُرُهُۥ وَرُسُلَهُۥ بِٱلۡغَيۡبِۚ إِنَّ ٱللَّهَ قَوِيٌّ عَزِيزٞ ٢٥

We have already sent Our messengers with clear evidences and sent down with them the Scripture and the balance that the people may maintain [their affairs] in justice. And We sent down iron, wherein is great military might and benefits for the people, and so that Allah may make evident those who support Him and His messengers unseen. Indeed, Allah is Powerful and Exalted in Might.

Translation: Sahih International — quran.com/57:25

Allah says: ***"We sent down iron, wherein is great military might and benefits for the people"***. The same verse mentions ***the balance*** — accurate weighing. Tafsir Ibn Kathir 57:25.

Al-Biruni's study of ***weights and density*** helped merchants tell ***pure metals*** from adulterated ones. Science supports ***justice*** in trade.

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MEDICINES: KITAB AL-SAYDANA

At over 80 years of age, al-Biruni wrote ***Kitab al-Saydana fi al-Tibb*** on ***medicines***. He listed more than ***1,000 medicinal substances*** — plants, minerals and animal products — with their names in ***Arabic, Persian, Greek, Syriac and Sanskrit***.

This effort grew from the conviction that every disease has a cure, as the Messenger of Allah ﷺ said:

HADITH — SAHIH AL-BUKHARI, NO. 5678

حَدَّثَنَا مُحَمَّدُ بْنُ الْمُثَنَّى، حَدَّثَنَا أَبُو أَحْمَدَ الزُّبَيْرِيُّ، حَدَّثَنَا عُمَرُ بْنُ سَعِيدِ بْنِ أَبِي حُسَيْنٍ، قَالَ حَدَّثَنِي عَطَاءُ بْنُ أَبِي رَبَاحٍ، عَنْ أَبِي هُرَيْرَةَ ـ رضى الله عنه ـ عَنِ النَّبِيِّ صلى الله عليه وسلم قَالَ «مَا أَنْزَلَ اللَّهُ دَاءً إِلاَّ أَنْزَلَ لَهُ شِفَاءً».

TRANSLATION:

Abu Hurayrah رضى الله عنه reported that the Prophet ﷺ said: **"Allah has not sent down any disease except that He has also sent down its cure."**

CHAIN OF NARRATION: Narrated by Imam al-Bukhari: from Muhammad ibn al-Muthanna, from Abu Ahmad az-Zubayri, from 'Umar ibn Sa'id ibn Abi Husayn, from 'Ata' ibn Abi Rabah, from Abu Hurairah رضى الله عنه.

REFERENCE: Narrated by Imam al-Bukhari in Sahih al-Bukhari, Book of Medicine, Hadith No. 5678.

GRADE: SAHIH — contained in Sahih al-Bukhari, the most authentic book of Hadith after the Qur'an by consensus of the Hadith scholars.

Source: https://sunnah.com/bukhari:5678

LESSONS FROM THIS HADITH

This Hadith encourages Muslims to ***seek cures*** and study ***pharmacology***. Al-Biruni, though not a physician, contributed by ***compiling the names of drugs*** so that physicians would not confuse one substance with another.

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ONE SUBSTANCE, MANY NAMES

Al-Biruni realised that one medicinal substance may have ***different names*** in every language. Confusion over names could lead to ***the wrong medicine*** being given to a patient.

SUBSTANCE	EXAMPLES OF NAMES IN OTHER LANGUAGES
Ginger	Zanjabil (Arabic), zingiber (Latin), shringavera (Sanskrit).
Cinnamon	Darsini (Arabic/Persian), cinnamomum (Latin).
Black seed	Habbat al-sawda' (Arabic), shuniz (Persian).

Today pharmacists use ***scientific names*** that are uniform across the world — the same goal that al-Biruni worked toward a thousand years ago.

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A CHANGING EARTH

While in India, al-Biruni observed ***rounded stones*** and ***layers of soil*** in the valley of the ***Ganges***. He reached a remarkable conclusion for his time.

> **HISTORY NOTE: A PLAIN THAT WAS ONCE SEA**
>
> Al-Biruni wrote that the plain of India ***was once a sea***, which was later ***filled with silt*** carried by the rivers.
>
> He noticed that ***large stones*** are found near the mountains, while ***fine sand*** lies far downstream — because the river current grows slower. This is a foundation of the ***geology*** of sedimentation.

LESSON

The earth is ***always changing*** by the will of Allah — mountains erode, rivers carry silt, and new plains form. Observing these changes increases our ***awe*** of the Creator.

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ARE THOSE WHO KNOW EQUAL?

SURAH AZ-ZUMAR 39:9

أَمَّنْ هُوَ قَٰنِتٌ ءَانَآءَ ٱلَّيْلِ سَاجِدًا وَقَآئِمًا يَحْذَرُ ٱلْءَاخِرَةَ وَيَرْجُوا۟ رَحْمَةَ رَبِّهِۦ ۗ قُلْ هَلْ يَسْتَوِى ٱلَّذِينَ يَعْلَمُونَ وَٱلَّذِينَ لَا يَعْلَمُونَ ۗ إِنَّمَا يَتَذَكَّرُ أُو۟لُوا۟ ٱلْأَلْبَٰبِ ﴿٩﴾

Is one who is devoutly obedient during periods of the night, prostrating and standing [in prayer], fearing the Hereafter and hoping for the mercy of his Lord, [like one who does not]? Say, "Are those who know equal to those who do not know?" Only they will remember [who are] people of understanding.

Translation: Sahih International — quran.com/39:9

Allah asks: ***"Are those who know equal to those who do not know?"*** The verse opens with the picture of one who ***worships at night***, then honours ***knowledge***. Tafsir Ibn Kathir 39:9.

Al-Biruni combined ***knowledge and worship***. In the introductions to his books he praised Allah and stated that the aim of knowledge is to seek ***the truth***.

LESSON

True knowledge ***does not take*** a person away from Allah. On the contrary, the deeper the knowledge, the clearer the ***signs*** of His greatness.

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SEEKING KNOWLEDGE TO THE LAST BREATH

Al-Biruni kept writing into old age — among his last works were ***Kitab al-Saydana*** on medicines and ***al-Jamahir*** on gemstones and metals. His passion for knowledge did not fade even in his final moments.

> **HISTORY NOTE: A SCHOLAR'S LAST QUESTION**
>
> Yaqut al-Hamawi, in ***Mu'jam al-Udaba'***, relates the account of a jurist, Abu al-Hasan 'Ali ibn 'Isa al-Walwaliji, who visited al-Biruni when he was close to death. Though dying, al-Biruni ***asked about a question of inheritance law***.
>
> When the jurist asked why he would ask in such a state, al-Biruni replied that ***leaving this world knowing*** the answer was better than leaving it in ignorance. The jurist said that soon after he left, he heard weeping — al-Biruni had passed away. This story is ***famous but comes from later reports***.

This spirit agrees with the promise of the Messenger of Allah ﷺ to seekers of knowledge, as in the Hadith on the next page.

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HADITH — SAHIH MUSLIM, NO. 2699

حَدَّثَنَا يَحْيَى بْنُ يَحْيَى التَّمِيمِيُّ، وَأَبُو بَكْرِ بْنُ أَبِي شَيْبَةَ وَمُحَمَّدُ بْنُ الْعَلاَءِ الْهَمْدَانِيُّ - وَاللَّفْظُ لِيَحْيَى - قَالَ يَحْيَى أَخْبَرَنَا وَقَالَ الآخَرَانِ، حَدَّثَنَا أَبُو مُعَاوِيَةَ، عَنِ الأَعْمَشِ، عَنْ أَبِي صَالِحٍ، عَنْ أَبِي هُرَيْرَةَ، قَالَ قَالَ رَسُولُ اللَّهِ صلى الله عليه وسلم «مَنْ نَفَّسَ عَنْ مُؤْمِنٍ كُرْبَةً مِنْ كُرَبِ الدُّنْيَا نَفَّسَ اللَّهُ عَنْهُ كُرْبَةً مِنْ كُرَبِ يَوْمِ الْقِيَامَةِ وَمَنْ يَسَّرَ عَلَى مُعْسِرٍ يَسَّرَ اللَّهُ عَلَيْهِ فِي الدُّنْيَا وَالآخِرَةِ وَمَنْ سَتَرَ مُسْلِمًا سَتَرَهُ اللَّهُ فِي الدُّنْيَا وَالآخِرَةِ وَاللَّهُ فِي عَوْنِ الْعَبْدِ مَا كَانَ الْعَبْدُ فِي عَوْنِ أَخِيهِ وَمَنْ سَلَكَ طَرِيقًا يَلْتَمِسُ فِيهِ عِلْمًا سَهَّلَ اللَّهُ لَهُ بِهِ طَرِيقًا إِلَى الْجَنَّةِ وَمَا اجْتَمَعَ قَوْمٌ فِي بَيْتٍ مِنْ بُيُوتِ اللَّهِ يَتْلُونَ كِتَابَ اللَّهِ وَيَتَدَارَسُونَهُ بَيْنَهُمْ إِلاَّ نَزَلَتْ عَلَيْهِمُ السَّكِينَةُ وَغَشِيَتْهُمُ الرَّحْمَةُ وَحَفَّتْهُمُ الْمَلاَئِكَةُ وَذَكَرَهُمُ اللَّهُ فِيمَنْ عِنْدَهُ وَمَنْ بَطَّأَ بِهِ عَمَلُهُ لَمْ يُسْرِعْ بِهِ نَسَبُهُ».

TRANSLATION:

Abu Hurayrah رضى الله عنه said: The Messenger of Allah ﷺ said: “Whoever relieves a believer of one of the hardships of this world, Allah will relieve him of one of the hardships of the Day of Resurrection. Whoever makes things easy for one in difficulty, Allah will make things easy for him in this world and the Hereafter. Whoever covers the faults of a Muslim, Allah will cover his faults in this world and the Hereafter. Allah helps His servant as long as the servant helps his brother. **Whoever follows a path in search of knowledge, Allah will make easy for him a path to Paradise.** No people gather in one of the houses of Allah, reciting the Book of Allah and studying it among themselves, except that tranquillity descends upon them, mercy covers them, the angels surround them, and Allah mentions them among those who are with Him. And whoever is held back by his deeds will not be hastened forward by his lineage.”

CHAIN OF NARRATION: Narrated by Imam Muslim: from Yahya ibn Yahya at-Tamimi, Abu Bakr ibn Abi Shaybah and Muhammad ibn al-‘Ala’ al-Hamdani, from Abu Mu‘awiyah, from al-A‘mash, from Abu Salih, from Abu Hurayrah رضى الله عنه.

REFERENCE: Narrated by Imam Muslim in Sahih Muslim, Book of Remembrance, Supplication, Repentance and Seeking Forgiveness, chapter on the virtue of gathering to recite the Qur’an and remember Allah, Hadith No. 2699a.

GRADE: SAHIH — contained in Sahih Muslim, the second most authentic book of Hadith after Sahih al-Bukhari.

Source: https://sunnah.com/muslim:2699a

LESSONS FROM THIS HADITH

Whoever travels a path in search of knowledge, Allah makes easy for him a path to Paradise. That path may be a long journey to another land — like al-Biruni's to India — or simply asking one question from a sickbed.

This Hadith also reminds us that ***honour is measured by deeds, not lineage***: "whoever is slowed down by his deeds will not be hastened by his lineage." Al-Biruni is remembered not for his ancestry, but for his knowledge and effort.

The same Hadith also mentions the virtue of ***relieving those in hardship*** and ***concealing the faults*** of others. True knowledge produces good character.

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THE LEGACY OF AL-BIRUNI

More than a thousand years after his birth, al-Biruni is still remembered around the world.

HONOUR	DESCRIPTION
Al-Biruni crater	A crater on the far side of the Moon is named after him.
Asteroid 9936 Al-Biruni	An asteroid is named after him.
The city of Beruniy	A city in Karakalpakstan, Uzbekistan, near his birthplace.
1000th anniversary (1973)	UNESCO celebrated the millennium of his birth with a special publication.
Universities and institutes	Several institutions in Central Asia are named after him.

The greatest honour is that ***his methods are still taught*** and ***his attitude is still followed*** — careful, honest and fair (Britannica: al-Biruni).

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AN EXAMPLE FOR STUDENTS TODAY

AL-BIRUNI'S ATTITUDE	PRACTICE TODAY
Learning other people's languages	Master foreign languages to read knowledge in the original.
Checking sources	Check news and information before sharing it on social media.
Measuring carefully	Use data and evidence, not mere assumptions.
Being fair to those who differ	Respect others even when you disagree.
Learning into old age	Keep reading and asking at every stage of life.

Al-Biruni proved that ***age, war and displacement*** need not stop anyone from contributing to knowledge.

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ESTABLISHED REPORTS AND POPULAR STORIES

The table below separates what is established from what needs checking about al-Biruni.

STORIES AND THEIR STATUS

POPULAR STATEMENT	STATUS
Al-Biruni measured the earth's radius from a hill near Nandana Fort.	Established. His method is described in his own works.
He wrote a book on India after learning Sanskrit.	Established. Tahqiq ma li-l-Hind still exists.
He corresponded with Ibn Sina.	Established. The letters al-As'ila wa al-Ajwiba still exist.
He asked a question of inheritance law while dying.	Reported by Yaqut al-Hamawi (13th century CE); famous but not fully verifiable.
He discovered the Americas.	Incorrect. He only conjectured the possible existence of inhabited land in the ocean.
Sultan Mahmud tested his prediction about which door the sultan would use, then threw him from a roof.	Weak. This story comes from Chahar Maqala (12th century CE) and is folklore.
His measurement matched the modern value exactly.	Exaggerated. His result was close, but its accuracy was partly fortunate.
"Seek knowledge even as far as China" is a saying of the Prophet ﷺ.	Very weak, even judged fabricated by some Hadith scholars. Use the authentic Hadith (Sahih Muslim 2699).

REFLECTION — HONOURING WITHOUT EXAGGERATING

Al-Biruni himself tried to ***report honestly*** about other peoples. We honour him in the same way: holding to what is established, and marking what is still uncertain.

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LESSONS AND CONCLUSION

LESSONS FROM THIS EBOOK

First: The sun and moon were made for us to reckon time — the science of calendars is a sign of Allah (10:5; 9:36).

Second: Every heavenly body swims in its orbit (21:33; 36:40).

Third: Know other peoples honestly and fairly (49:13; 5:8).

Fourth: The diversity of languages is a sign of Allah (30:22).

Fifth: Do not relate everything you hear without checking (Sahih Muslim, Introduction).

Sixth: Eclipses are signs of Allah, not omens (Sahih al-Bukhari 1041).

Seventh: Every disease has a cure — seek it with knowledge (Sahih al-Bukhari 5678).

Eighth: Accurate weighing is part of justice (57:25).

Ninth: Those who know are not equal to those who do not (39:9).

Tenth: The path of seeking knowledge is a path to Paradise (Sahih Muslim 2699).

Eleventh: Distinguish between certainty and conjecture — the attitude of an honest scholar.

CONCLUSION

Al-Biruni died in Ghazna around 1048 CE, yet his method of measuring the earth is still taught today. The next book of **Tracing the Scholars of Islam**, in sha Allah, will tell the story of ***Nasir al-Din al-Tusi***, the astronomer of the Maragha Observatory. Wallahu a'lam.

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GLOSSARY AND REFLECTION QUESTIONS

GLOSSARY

TERM	MEANING
Earth's radius	The distance from the earth's centre to its surface; about 6,371 km.
Dip angle of the horizon	The angle between the horizontal and the line to the horizon, seen from a high place.
Lunar calendar	A calendar based on the moon's cycle, such as the Hijri calendar.
Solar calendar	A calendar based on the sun's cycle.
Specific gravity	The ratio of a substance's weight to that of the same volume of water.
Pharmacology	The science of medicines.
Sedimentation	The process by which rivers carry and deposit silt and sand.
Coordinates	The latitude and longitude that fix the position of a place.

REFLECTION QUESTIONS

1. Why does Ramadan move through all the seasons in the Hijri calendar?

2. How did al-Biruni measure the earth's radius without a long journey?

3. What can we learn from al-Biruni's fairness when writing about India?

4. Why should we check news before relating it?

5. What does "seeking knowledge to the last breath" mean in your life?

SUGGESTED ACTIVITIES

Activity 1: Use a calculator to work out how many grains are on the 10th, 20th and 30th squares of the chessboard.

Activity 2: Compare the Gregorian start date of Ramadan for five consecutive years. By how many days does it shift each year?

Activity 3: Weigh a stone, then immerse it in a full container of water and measure the water that spills. Calculate its specific gravity as al-Biruni did.

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REFERENCES

THE QUR'AN

The Noble Qur'an, Uthmani text and Sahih International translation. https://quran.com

Tafsir Ibn Kathir, surahs 2, 5, 9, 10, 21, 30, 36, 39, 49 and 57. https://tafsir.app/ibn-katheer/10/5

HADITH

Sahih al-Bukhari 1041, 5678. https://sunnah.com/bukhari

Sahih Muslim 2699; Introduction to Sahih Muslim, no. 5. https://sunnah.com/muslim

HISTORY AND MODERN RESEARCH

Al-Biruni, al-Athar al-Baqiya; Tahqiq ma li-l-Hind; Tahdid Nihayat al-Amakin; al-Qanun al-Mas'udi; al-Jamahir; Kitab al-Saydana. Yaqut al-Hamawi, Mu'jam al-Udaba'.

Encyclopaedia Britannica, "al-Biruni". https://www.britannica.com/biography/al-Biruni

Wikipedia, "Al-Biruni". https://en.wikipedia.org/wiki/Al-Biruni

Etymological Dictionary of Astronomy and Astrophysics, "Biruni's method". https://dictionary.obspm.fr/terms/birunis-method/

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SURAH AL-BAQARAH 2:261

مَّثَلُ ٱلَّذِينَ يُنفِقُونَ أَمۡوَٰلَهُمۡ فِي سَبِيلِ ٱللَّهِ كَمَثَلِ حَبَّةٍ أَنۢبَتَتۡ سَبۡعَ سَنَابِلَ فِي كُلِّ سُنۢبُلَةٖ مِّاْئَةُ حَبَّةٖۗ وَٱللَّهُ يُضَٰعِفُ لِمَن يَشَآءُۚ وَٱللَّهُ وَٰسِعٌ عَلِيمٌ ٢٦١

The example of those who spend their wealth in the way of Allah is like a seed [of grain] which grows seven spikes; in each spike is a hundred grains. And Allah multiplies [His reward] for whom He wills. And Allah is all-Encompassing and Knowing.

Translation: Sahih International — quran.com/2:261

SURAH SABA' 34:39

قُلۡ إِنَّ رَبِّي يَبۡسُطُ ٱلرِّزۡقَ لِمَن يَشَآءُ مِنۡ عِبَادِهِۦ وَيَقۡدِرُ لَهُۥۚ وَمَآ أَنفَقۡتُم مِّن شَيۡءٖ فَهُوَ يُخۡلِفُهُۥۖ وَهُوَ خَيۡرُ ٱلرَّٰزِقِينَ ٣٩

Say, "Indeed, my Lord extends provision for whom He wills of His servants and restricts [it] for him. But whatever thing you spend [in His cause] - He will compensate it; and He is the best of providers."

Translation: Sahih International — quran.com/34:39

HADITH — SAHIH MUSLIM, NO. 2588

حَدَّثَنَا يَحْيَى بْنُ أَيُّوبَ، وَقُتَيْبَةُ، وَابْنُ، حُجْرٍ قَالُوا حَدَّثَنَا إِسْمَاعِيلُ، - وَهُوَ ابْنُ جَعْفَرٍ - عَنِ الْعَلاَءِ، عَنْ أَبِيهِ، عَنْ أَبِي هُرَيْرَةَ، عَنْ رَسُولِ اللَّهِ صلى الله عليه وسلم قَالَ « مَا نَقَصَتْ صَدَقَةٌ مِنْ مَالٍ وَمَا زَادَ اللَّهُ عَبْدًا بِعَفْوٍ إِلاَّ عِزًّا وَمَا تَوَاضَعَ أَحَدٌ لِلَّهِ إِلاَّ رَفَعَهُ اللَّهُ ».

TRANSLATION:

Abu Hurayrah رضى الله عنه narrated that the Messenger of Allah ﷺ said: "Charity does not decrease wealth.

Allah does not increase a servant who forgives except in honour. And no one humbles himself for the sake of Allah except that Allah raises him in rank."

CHAIN OF NARRATION: Narrated by Imam Muslim: from Yahya bin Ayyub, Qutaibah bin Sa'id and 'Ali bin Hujr, from Isma'il bin Ja'far, from al-'Ala' bin 'Abd al-Rahman, from his father 'Abd al-Rahman bin Ya'qub, from Abu Hurayrah رضى الله عنه .

REFERENCE: Narrated by Imam Muslim in Sahih Muslim, Book of Virtue, Good Manners and Joining the Ties of Kinship (Kitab al-Birr wa al-Silah wa al-Adab), chapter on the encouragement of forgiveness and humility, Hadith No. 2588.

GRADE: SAHIH — contained in Sahih Muslim.

Source: https://sunnah.com/muslim:2588

HADITH — SAHIH MUSLIM, NO. 1631

حَدَّثَنَا يَحْيَى بْنُ أَيُّوبَ، وَقُتَيْبَةُ - يَعْنِي ابْنَ سَعِيدٍ - وَابْنُ حُجْرٍ قَالُوا حَدَّثَنَا إِسْمَاعِيلُ، - هُوَ ابْنُ جَعْفَرٍ - عَنِ الْعَلاَءِ، عَنْ أَبِيهِ، عَنْ أَبِي هُرَيْرَةَ، أَنَّ رَسُولَ اللَّهِ صلى الله عليه وسلم قَالَ « إِذَا مَاتَ الإِنْسَانُ انْقَطَعَ عَنْهُ عَمَلُهُ إِلاَّ مِنْ ثَلاَثَةٍ إِلاَّ مِنْ صَدَقَةٍ جَارِيَةٍ أَوْ عِلْمٍ يُنْتَفَعُ بِهِ أَوْ وَلَدٍ صَالِحٍ يَدْعُو لَهُ ».

TRANSLATION:

Abu Hurayrah رضى الله عنه narrated that the Messenger of Allah ﷺ said: "When a person dies, his deeds come to an end except for three: an ongoing charity, knowledge that is benefited from, or a righteous child who prays for him."

CHAIN OF NARRATION: Narrated by Imam Muslim: from Yahya bin Ayyub, Qutaibah bin Sa'id and 'Ali bin Hujr, from Isma'il bin Ja'far, from al-'Ala' bin 'Abd al-Rahman, from his father 'Abd al-Rahman bin Ya'qub, from Abu Hurayrah رضى الله عنه .

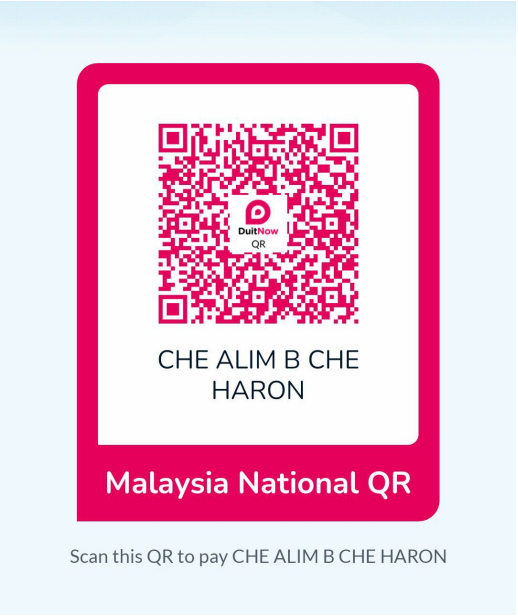
REFERENCE: Narrated by Imam Muslim in Sahih Muslim, Book of Wills (Kitab al-Wasiyyah), chapter on the reward that reaches a person after his death, Hadith No. 1631.

GRADE: SAHIH — contained in Sahih Muslim.

Source: https://sunnah.com/muslim:1631

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