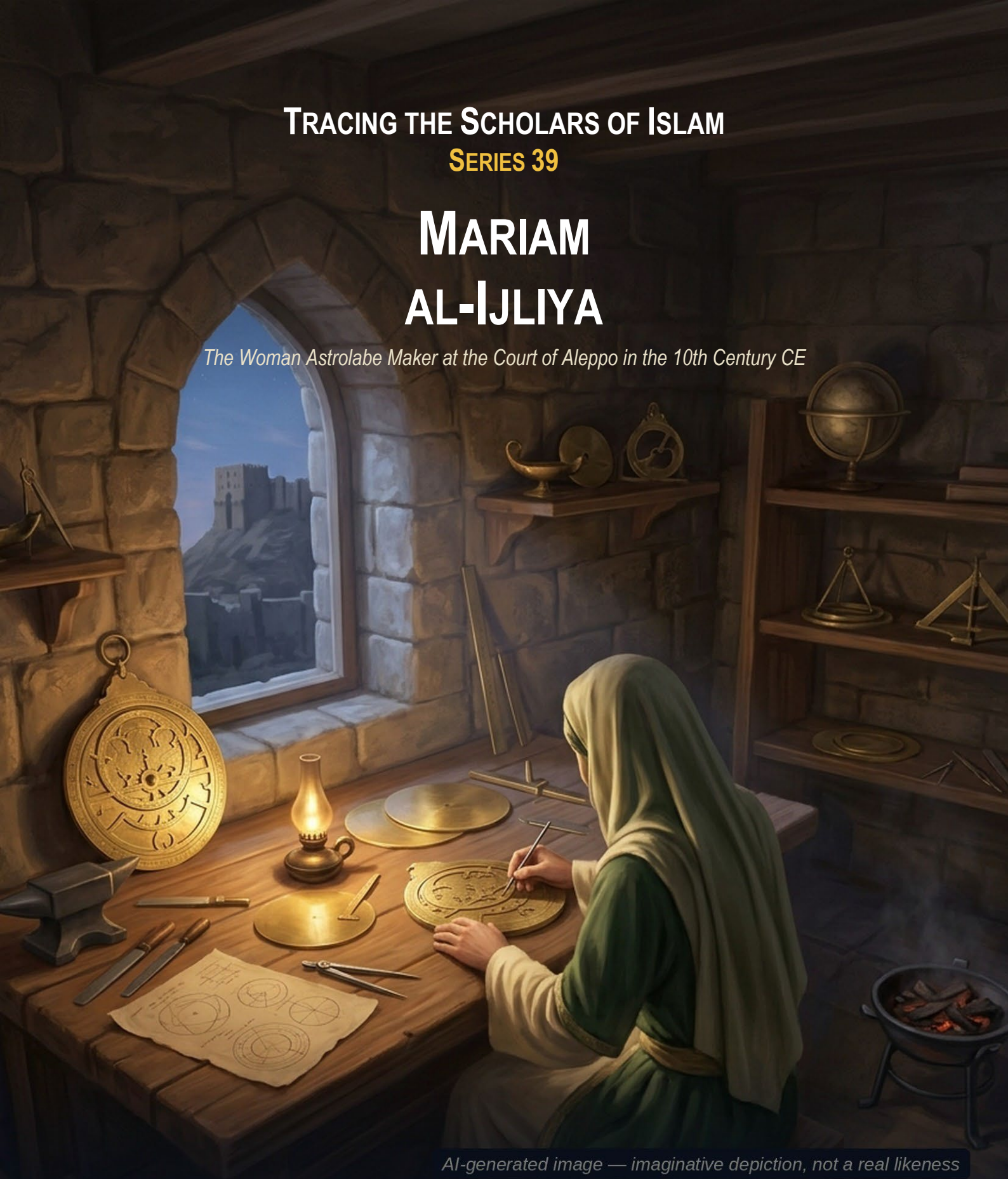
Tracing the Scholars of Islam

Series 39

Mariam al-Ijliya

The Woman Astrolabe Maker at the Court of Aleppo in the 10th Century CE



AI-generated image — imaginative depiction, not a real likeness

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

TRACING THE SCHOLARS OF ISLAM

SERIES 39

MARIAM AL-IJLIYA

The Woman Astrolabe Maker at the Court of Aleppo in the 10th Century CE

وَهُوَ ٱلَّذِي جَعَلَ لَكُمُ ٱلنُّجُومَ لِتَهۡتَدُواْ بِهَا فِي ظُلُمَٰتِ ٱلۡبَرِّ وَٱلۡبَحۡرِۗ قَدۡ فَصَّلۡنَا ٱلۡأٓيَٰتِ لِقَوۡمٖ يَعۡلَمُونَ

"And it is He who placed for you the stars that you may be guided by them through the darknesses of the land and sea. We have detailed the signs for a people who know."

SURAH AL-AN'AM 6:97

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ACKNOWLEDGEMENT

All praise is due to Allah, who placed the stars as guides through the darkness of land and sea. 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 thirty-ninth book of Tracing the Scholars of Islam tells the story of a woman astrolabe maker in Aleppo, mentioned in only one line of a historical source — yet her name now graces an asteroid. May her story teach us to strive for what is beneficial, and to be honest about what we know and do not know.

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ABOUT THE COVER OF THIS EBOOK

The cover of this eBook is an **AI-generated image** — an ***imaginative depiction, not a real likeness*** of al-'Ijliyyah. This label is also printed on the cover. This time the viewpoint is ***from an upper corner of the room***, looking diagonally down; she is shown ***from behind without a face*** and modestly dressed.

She sits at a wooden bench ***engraving a brass astrolabe plate***. On the bench are **a finished astrolabe**, several **brass plates**, an **anvil**, **files**, **compasses** and a **sheet of circle diagrams**.

Through an **arched window** the **Citadel of Aleppo** can be seen on its hill at dusk. The ***glass-chimney lamp*** in this image is an AI addition that is not historically accurate — in the 10th century, oil lamps were usually of pottery or brass, without glass.

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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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MARIAM AL-IJLIYA

The thirty-ninth book of **Tracing the Scholars of Islam** tells the story of a woman known in the sources as ***al-'Ijliyyah bint al-'Ijli*** — an ***astrolabe*** maker at the court of Aleppo in the ***10th century CE***. Today she is popularly known as ***"Mariam al-Asturlabiyyah"*** or ***"Mariam al-Ijliya"***.

Very ***little is known*** about her — just one line in a book. This eBook explains honestly ***what is known*** and ***what was added later***.

For that reason, this eBook also describes the world around her: ***the stars and the heavens*** in the Qur'an, ***Aleppo*** in the Hamdanid era, the ***astrolabe*** — how it was made and used — and its role in ***prayer times, the qiblah and the new moon***.

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. The cover image is an AI-generated image and is marked as such. Her years of birth and death are unknown.*

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STARS AS GUIDES

SURAH AL-AN'AM 6:97

وَهُوَ ٱلَّذِى جَعَلَ لَكُمُ ٱلنُّجُومَ لِتَهۡتَدُواْ بِهَا فِى ظُلُمَٰتِ ٱلۡبَرِّ وَٱلۡبَحۡرِۗ قَدۡ فَصَّلۡنَا ٱلۡأٓيَٰتِ لِقَوۡمٍ يَعۡلَمُونَ ٩٧

And it is He who placed for you the stars that you may be guided by them through the darknesses of the land and sea. We have detailed the signs for a people who know.

Translation: Sahih International — quran.com/6:97

Allah placed the stars ***"that you may be guided by them through the darknesses of the land and sea"***. The astrolabe is an instrument that helps people ***read the sky*** precisely. Tafsir Ibn Kathir 6:97.

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THE HEAVEN ADORNED WITH STARS

SURAH AL-MULK 67:5

وَلَقَدْ زَيَّنَّا ٱلسَّمَآءَ ٱلدُّنْيَا بِمَصَٰبِيحَ وَجَعَلْنَٰهَا رُجُومًا لِّلشَّيَٰطِينِ ۖ وَأَعْتَدْنَا لَهُمْ عَذَابَ ٱلسَّعِيرِ ۝٥

And We have certainly beautified the nearest heaven with stars and have made [from] them what is thrown at the devils and have prepared for them the punishment of the Blaze.

Translation: Sahih International — quran.com/67:5

Allah says: ***"We have certainly beautified the nearest heaven with stars"***. Tafsir Ibn Kathir 67:5.

The stars are not merely ***adornment***. They are also ***guides*** for travellers, sailors and astronomers. The astrolabe records the positions of ***bright stars*** on the part called the ***rete***.

ROLE OF THE STARS	EXAMPLE
Adorning the sky	The wonderful beauty of the night sky.
Guiding direction	Sailors and caravans find their way.
Marking time	The position of stars shows the hour of night.
Objects of study	Astronomers record their positions and motions.

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THE SUN AND MOON BY CALCULATION

SURAH AR-RAHMAN 55:5

ٱلشَّمۡسُ وَٱلۡقَمَرُ بِحُسۡبَانٖ ۝٥

The sun and the moon [move] by precise calculation.

Translation: Sahih International — quran.com/55:5

"The sun and the moon [move] by precise calculation". Tafsir Ibn Kathir 55:5.

SURAH YUNUS 10:5

هُوَ ٱلَّذِي جَعَلَ ٱلشَّمۡسَ ضِيَآءٗ وَٱلۡقَمَرَ نُورٗا وَقَدَّرَهُۥ مَنَازِلَ لِتَعۡلَمُواْ عَدَدَ ٱلسِّنِينَ وَٱلۡحِسَابَۚ مَا خَلَقَ ٱللَّهُ ذَٰلِكَ إِلَّا بِٱلۡحَقِّۚ يُفَصِّلُ ٱلۡأٓيَٰتِ لِقَوۡمٖ يَعۡلَمُونَ ۝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 for it phases"***, ***"that you may know the number of years and account [of time]"***. Tafsir Ibn Kathir 10:5.

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EACH MOVES IN ITS 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

"all [heavenly bodies] in an orbit are swimming". Tafsir Ibn Kathir 21:33.

Because the sun, moon and stars move ***by fixed calculation***, people could build instruments like the ***astrolabe*** to predict their positions. The precision of nature is ***a sign of the wisdom of its Creator***.

HEAVENLY BODY	USE FOR HUMANITY
The sun	Daytime, seasons and prayer times.
The moon	Hijri months, fasting and Hajj.
The stars	Direction and the hours of the night.

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THE HEAVEN BUILT WITH STRENGTH

SURAH ADH-DHARIYAT 51:47

وَٱلسَّمَآءَ بَنَيۡنَٰهَا بِأَيۡيْدٖ وَإِنَّا لَمُوسِعُونَ ٤٧

And the heaven We constructed with strength, and indeed, We are [its] expander.

Translation: Sahih International — quran.com/51:47

"And the heaven We constructed with strength". Tafsir Ibn Kathir 51:47.

SURAH AL 'IMRAN 3:190–191

إِنَّ فِي خَلۡقِ ٱلسَّمَٰوَٰتِ وَٱلۡأَرۡضِ وَٱخۡتِلَٰفِ ٱلَّيۡلِ وَٱلنَّهَارِ لَأٓيَٰتٖ لِّأُوْلِي ٱلۡأَلۡبَٰبِ ١٩٠

Indeed, in the creation of the heavens and the earth and the alternation of the night and the day are signs for those of understanding.

ٱلَّذِينَ يَذۡكُرُونَ ٱللَّهَ قِيَٰمٗا وَقُعُودٗا وَعَلَىٰ جُنُوبِهِمۡ وَيَتَفَكَّرُونَ فِي خَلۡقِ ٱلسَّمَٰوَٰتِ وَٱلۡأَرۡضِ رَبَّنَا مَا خَلَقۡتَ هَٰذَا بَٰطِلٗا سُبۡحَٰنَكَ فَقِنَا عَذَابَ ٱلنَّارِ ١٩١

Who remember Allah while standing or sitting or [lying] on their sides and give thought to the creation of the heavens and the earth, [saying], "Our Lord, You did not create this aimlessly; exalted are You [above such a thing]; then protect us from the punishment of the Fire."

Translation: Sahih International — quran.com/3:190-191

"Indeed, in the creation of the heavens and the earth and the alternation of the night and the day are signs for those of understanding". Tafsir Ibn Kathir 3:190.

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PEOPLE OF UNDERSTANDING: REMEMBERING AND REFLECTING

Verse 3:191 speaks of those who ***remember Allah*** in every state and ***reflect on the creation of the heavens and the earth***. They say: ***"Our Lord, You did not create this aimlessly"***.

QUALITY OF THE PEOPLE OF UNDERSTANDING	EXAMPLE IN LIFE
Remembering Allah	Remembrance while standing, sitting and lying down.
Reflecting on creation	Observing the sky, the stars and nature.
Recognising wisdom	Certainty that nothing was created in vain.
Fearing Allah	Praying to be protected from punishment.

A believing astrolabe maker or user combines ***knowledge and remembrance*** — observing the sky while remembering its Creator.

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THE AGE: ALEPPO AND THE HAMDANID DYNASTY

In the 10th century CE, the power of the Abbasid Caliph in Baghdad was weakening, and several local dynasties arose. One was the ***Hamdanid*** dynasty, which ruled ***Mosul*** and ***Aleppo***.

HISTORY NOTE: ALEPPO ON THE FRONTIER

Aleppo (Halab) lies in northern Syria, near the border with the ***Byzantine Empire***. Its ruler, ***Sayf ad-Dawlah***, was famous for fighting to defend the Muslim frontier.

Though busy with war, his court became a famous ***centre of learning and literature*** in its time.

REFERENCES:

Wikipedia, "Al-'Ijliyyah". https://en.wikipedia.org/wiki/Al-%CA%BBIjliyyah

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ALEPPO IN HISTORY

PERIOD	DESCRIPTION
7th century CE	Aleppo comes under Muslim rule.
944–967 CE	Sayf ad-Dawlah rules Aleppo.
c. 987 CE	Ibn an-Nadim completes al-Fihrist, which mentions al-'Ijliyyah.
Today	The Citadel of Aleppo still stands as a historic heritage.

Aleppo shows that ***knowledge can flourish*** even in challenging times, when leaders ***value learning***.

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THE LEARNED COURT OF SAYF AD-DAWLAH

Sayf ad-Dawlah (reigned 944–967 CE) was famous for gathering ***scholars, poets and philosophers*** at his court. In this setting al-'Ijliyyah served as an astrolabe maker.

FIGURE AT SAYF AD-DAWLAH'S COURT	FIELD
Al-Farabi	Philosopher and musician, called "the Second Teacher".
Al-Mutanabbi	A very famous Arabic poet.
Abu Firas al-Hamdani	Poet and cousin of Sayf ad-Dawlah.
Al-'Ijliyyah	Astrolabe maker.

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A LEADER WHO VALUED KNOWLEDGE

The story of this court teaches that ***leaders who sponsor learning*** can produce a flourishing civilisation. Scholars, poets and skilled craftspeople were all given a place.

FORM OF PATRONAGE	EFFECT
Salaries and gifts	Scholars could focus on their work.
Libraries	Books were collected and copied.
Learned gatherings	Discussion and exchange of ideas.
Commissioned instruments	Skilled makers like astrolabists found work.

Today, support for ***education and research*** is still the key to the Ummah's progress.

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WHO WAS AL-'IJLIYYAH?

She was the daughter of ***al-'Ijli***, an astrolabe maker. She and her father learned astrolabe making from ***Nastulus*** (Muhammad ibn 'Abdillah), a famous astrolabe maker in ***Baghdad***.

She later served ***Sayf ad-Dawlah***, ruler of ***Aleppo*** (944–967 CE) of the Hamdanid dynasty.

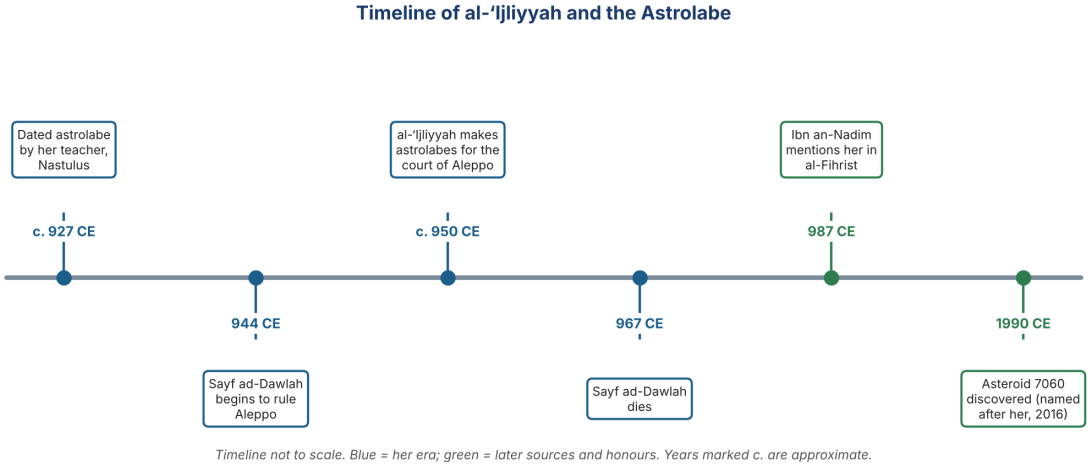


Figure 1: Timeline of al-'Ijliyyah and the astrolabe.

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A SKILLED TEACHER: NASTULUS

Al-'Ijliyyah's teacher, ***Nastulus***, was one of the famous astrolabe makers of Baghdad. His astrolabe dated ***315 AH (927/928 CE)*** is considered ***the oldest surviving astrolabe*** today, and is now kept in ***Kuwait***.

HISTORY NOTE: THE ASTROLABES OF NASTULUS

The Kuwait astrolabe has ***one plate*** for latitudes 33° and 36°, ***quadrant scales*** and a ***shadow scale***. It reads: "Made by Nastulus in the year 315."

Another, undated astrolabe, kept in the ***Museum of Islamic Art in Cairo***, contains a ***list of cities*** with their latitudes — the earliest of its kind on an instrument.

The astronomers ***as-Sijzi*** and ***al-Biruni*** credit Nastulus with designing the ***crab-shaped rete***.

REFERENCES:

Encyclopaedia of Astronomers (McGill), "Nastulus". https://islamsci.mcgill.ca/RASI/BEA/Nastulus_BEA.htm

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LEARNING FROM A SKILLED TEACHER

Al-'Ijliyyah and her father ***learned from an expert***. Fine skills like astrolabe making were passed on through ***a teacher's guidance*** and ***long practice***.

STAGE OF LEARNING	EXPLANATION
Watching the teacher	Seeing how to measure, cut and engrave.
Practising	Making small parts under guidance.
Understanding the science	Studying the mathematics and astronomy behind the instrument.
Independence	Making instruments for clients oneself.

The chain of ***teacher and student*** is how knowledge was preserved in Islamic civilisation — whether religious knowledge or manual skill.

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WHAT IS AN ASTROLABE?

The ***astrolabe*** is a brass instrument that served as the "sky computer" of its time. By rotating its parts, the user could ***tell the time***, ***measure the altitude of stars***, and ***find directions***.

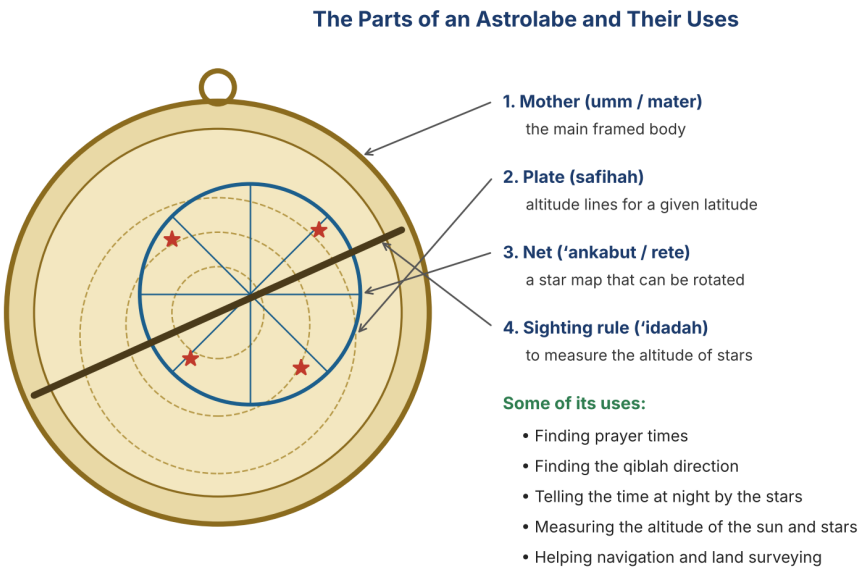


Figure 2: The main parts of an astrolabe and some of its uses.

The name "astrolabe" comes from a Greek term meaning ***"star holder"*** (Muslim Heritage: Using an Astrolabe).

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PARTS OF THE ASTROLABE

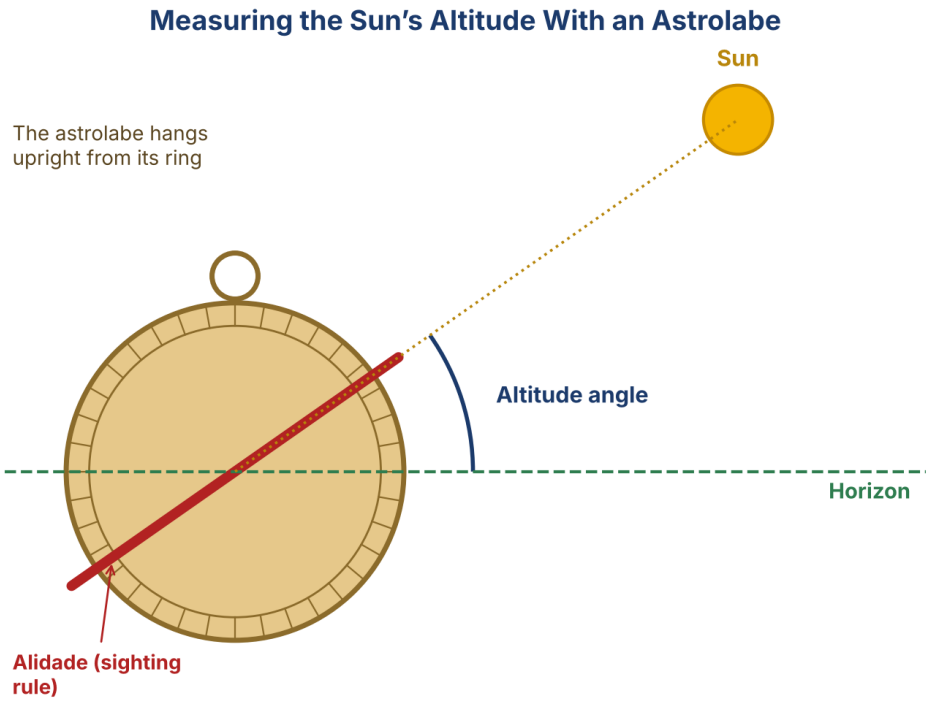
PART	FUNCTION
Mater (mother)	The base plate holding the other parts.
Plate	Engraved for a given latitude, with altitude lines from horizon to zenith.
Rete (web)	A pierced plate showing the stars and the ecliptic.
Alidade	A sighting rule for observing and reading scales.

Making an astrolabe required ***knowledge of mathematics and astronomy***, and ***very fine craftsmanship*** — every line had to be engraved precisely so that readings would not go astray.

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HOW TO USE AN ASTROLABE

The basic use of the astrolabe is ***measuring the altitude*** of the sun or a star above the horizon. From this measurement, the user can calculate ***the time*** and other information.



The user sights the sun through the holes in the alidade, then reads the angle on the scale on the back of the astrolabe.

Figure 3: Measuring the sun's altitude with an astrolabe.

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BASIC STEPS

STEP	EXPLANATION
1. Hang the astrolabe	Hold its ring so the astrolabe hangs upright.
2. Sight the sun	Turn the alidade until light passes through both holes.
3. Read the angle	Read the altitude on the scale on the back.
4. Turn the rete	On the front, set the sun's position on the same altitude line.
5. Read the time	Read the time on the scale at the edge of the mater.

According to Muslim Heritage, the astronomer ***'Abd ar-Rahman as-Sufi*** of Isfahan in the 10th century CE described ***over 1,000 uses*** of the astrolabe (Muslim Heritage).

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THE HISTORY OF THE ASTROLABE

The astrolabe is thought to have originated in ***ancient Greece***. ***Hipparchus*** (around 150 BCE) is associated with ***stereographic projection***, the mathematical method on which the astrolabe is based (Muslim Heritage).

Muslim scholars ***developed and refined*** the astrolabe, adding scales, city lists and lines for ***prayer times and the qiblah***. The astrolabe later reached ***Europe*** through al-Andalus around the 13th century CE.

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THE JOURNEY OF THE ASTROLABE

PERIOD	DEVELOPMENT
c. 150 BCE	Hipparchus and stereographic projection.
927/928 CE	The astrolabe of Nastulus — the oldest surviving.
10th century CE	As-Sufi describes over 1,000 uses of the astrolabe.
10th century CE	Al-'Ijliyyah makes astrolabes in Aleppo.
c. 13th century CE	The astrolabe reaches Europe through al-Andalus.

The astrolabe is an example of ***knowledge inherited, improved and passed on*** — from Greece to the Muslim world, then to Europe.

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ONE LINE IN AL-FIHRIST

The only early source about her is ***al-Fihrist*** by ***Ibn an-Nadim*** (987 CE), a famous catalogue of books and scholars.

HISTORY NOTE: WHAT IS SAID, AND WHAT IS NOT

In his list of astrolabe makers, Ibn an-Nadim mentions ***al-'Ijliyyah***, daughter of al-'Ijli, as a pupil of Nastulus who ***served Sayf ad-Dawlah***. That is all.

The name ***"Mariam" does not appear*** in this source. The title "al-Asturlabiyyah" means ***"the astrolabe maker"*** — a title of profession, not a personal name.

REFERENCES:

Wikipedia, "Al-'Ijliyyah". https://en.wikipedia.org/wiki/Al-%CA%BBIjliyyah

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LEARNING TO ASSESS SOURCES

QUESTION	ANSWER FOR THE STORY OF AL-'IJLIYYAH
What is the earliest source?	Al-Fihrist, Ibn an-Nadim (987 CE).
What does it mention?	Her name, her father, her teacher and her service to Sayf ad-Dawlah.
What does it not mention?	The name "Mariam", dates of birth and death, and specific inventions.
What was added later?	The name "Mariam" and popular stories.

This method teaches us to ***honour a figure*** without ***inventing stories*** that have no source.

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PRAYER AT ITS PROPER TIME

One important use of the astrolabe in the Muslim world was determining ***prayer times***. The Messenger of Allah ﷺ named prayer at its proper time as the deed most beloved to Allah:

HADITH — SAHIH AL-BUKHARI, NO. 527

حَدَّثَنَا أَبُو الْوَلِيدِ، هِشَامُ بْنُ عَبْدِ الْمَلِكِ قَالَ حَدَّثَنَا شُعْبَةُ، قَالَ الْوَلِيدُ بْنُ الْعَيْزَارِ أَخْبَرَنِي قَالَ سَمِعْتُ أَبَا عَمْرٍو الشَّيْبَانِيَّ، يَقُولُ حَدَّثَنَا صَاحِبُ، هَذِهِ الدَّارِ وَأَشَارَ إِلَى دَارِ عَبْدِ اللَّهِ قَالَ سَأَلْتُ النَّبِيَّ صلى الله عليه وسلم أَىُّ الْعَمَلِ أَحَبُّ إِلَى اللَّهِ قَالَ «الصَّلاَةُ عَلَى وَقْتِهَا». قَالَ ثُمَّ أَىٌّ قَالَ «ثُمَّ بِرُّ الْوَالِدَيْنِ». قَالَ ثُمَّ أَىٌّ قَالَ «الْجِهَادُ فِي سَبِيلِ اللَّهِ». قَالَ حَدَّثَنِي بِهِنَّ وَلَوِ اسْتَزَدْتُهُ لَزَادَنِي.

TRANSLATION:

Abu ‘Amr ash-Shaybani said: The owner of this house — pointing to the house of ‘Abdullah (ibn Mas‘ud رضى الله عنه) — told us: I asked the Prophet ﷺ: **“Which deed is most beloved to Allah?” He said: “Prayer at its proper time.”** I asked: “Then what?” He said: “Then kindness to parents.” I asked: “Then what?” He said: “Striving in the way of Allah.” He said: He told me these, and had I asked for more, he would have told me more.

CHAIN OF NARRATION: Narrated by Imam al-Bukhari: from Abu al-Walid Hisham ibn ‘Abd al-Malik, from Shu‘bah, from al-Walid ibn al-‘Ayzar, from Abu ‘Amr ash-Shaybani, from ‘Abdullah ibn Mas‘ud رضى الله عنه.

REFERENCE: Narrated by Imam al-Bukhari in Sahih al-Bukhari, Book of the Times of Prayer, Chapter on the Virtue of Prayer at Its Time, Hadith No. 527.

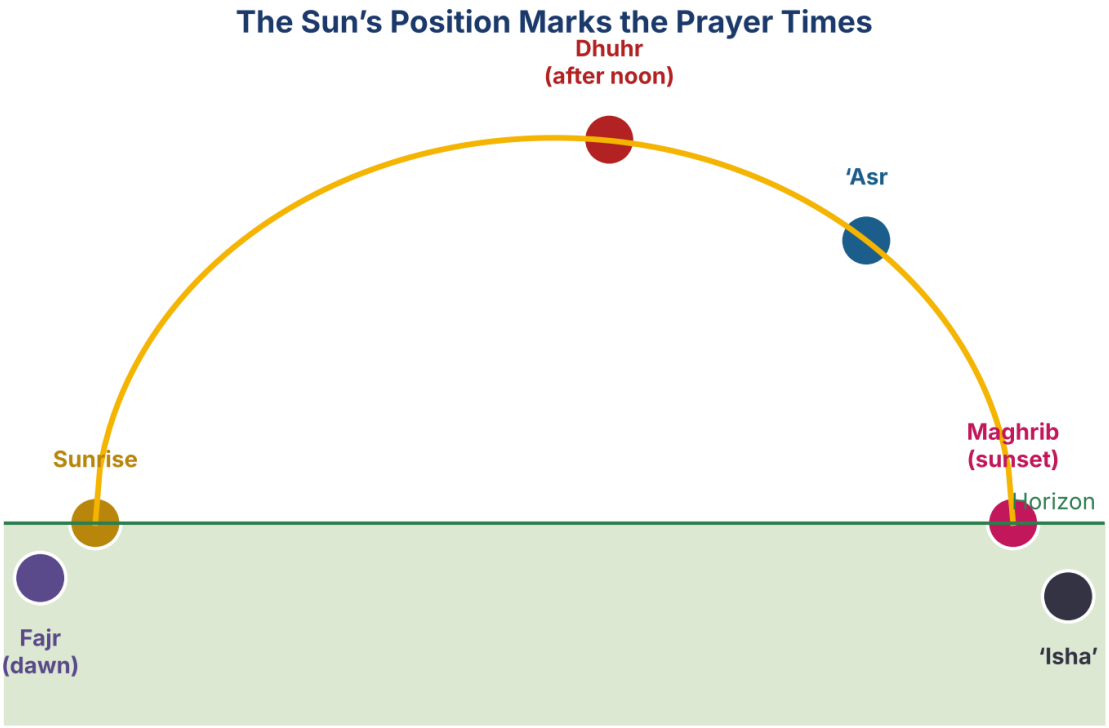
GRADE: SAHIH — contained in Sahih al-Bukhari, the most authentic book of Hadith after the Qur'an by consensus of the Hadith scholars.

Source: https://sunnah.com/bukhari:527

LESSONS FROM THIS HADITH

Prayer at its proper time comes before other great deeds. Astronomy and instruments such as the astrolabe help Muslims ***keep the times*** of this worship.

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Astronomy and instruments such as the astrolabe help calculate these times precisely.

Figure 4: The sun's position marks the prayer times.

HADITH — SAHIH MUSLIM, NO. 612

حَدَّثَنَا أَبُو غَسَّانَ الْمِسْمَعِيُّ، وَمُحَمَّدُ بْنُ الْمُثَنَّى، قَالاَ حَدَّثَنَا مُعَاذٌ، - وَهُوَ ابْنُ هِشَامٍ - حَدَّثَنِي أَبِي، عَنْ قَتَادَةَ، عَنْ أَبِي أَيُّوبَ، عَنْ عَبْدِ اللَّهِ بْنِ عَمْرٍو، أَنَّ نَبِيَّ اللَّهِ صلى الله عليه وسلم قَالَ «إِذَا صَلَّيْتُمُ الْفَجْرَ فَإِنَّهُ وَقْتٌ إِلَى أَنْ يَطْلُعَ قَرْنُ الشَّمْسِ الأَوَّلُ ثُمَّ إِذَا صَلَّيْتُمُ الظُّهْرَ فَإِنَّهُ وَقْتٌ إِلَى أَنْ يَحْضُرَ الْعَصْرُ فَإِذَا صَلَّيْتُمُ الْعَصْرَ فَإِنَّهُ وَقْتٌ إِلَى أَنْ تَصْفَرَّ الشَّمْسُ فَإِذَا صَلَّيْتُمُ الْمَغْرِبَ فَإِنَّهُ وَقْتٌ إِلَى أَنْ يَسْقُطَ الشَّفَقُ فَإِذَا صَلَّيْتُمُ الْعِشَاءَ فَإِنَّهُ وَقْتٌ إِلَى نِصْفِ اللَّيْلِ».

TRANSLATION:

'Abdullah ibn 'Amr رضى الله عنهما reported that the Prophet of Allah ﷺ said: **"When you pray Fajr, its time lasts until the first edge of the sun rises. When you pray Zuhr, its time lasts until 'Asr comes. When you pray 'Asr, its time lasts until the sun turns yellow. When you pray Maghrib, its time lasts until the twilight disappears. When you pray 'Isha', its time lasts until half the night."**

CHAIN OF NARRATION: Narrated by Imam Muslim: from Abu Ghassan al-Misma'i and Muhammad ibn al-Muthanna, from Mu'adh (ibn Hisham), from his father (Hisham ad-Dastuwa'i), from Qatadah, from Abu Ayyub (al-Maraghi), from 'Abdullah ibn 'Amr رضى الله عنهما.

REFERENCE: Narrated by Imam Muslim in Sahih Muslim, Book of Mosques and Places of Prayer, Hadith No. 612.

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

Source: https://sunnah.com/muslim:612a

LESSONS FROM THIS HADITH

Each prayer time is marked by ***the position of the sun*** — dawn, the sun's decline, yellowing, sunset and the disappearance of twilight. The astrolabe allowed these times to be ***calculated precisely***.

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FACING THE QIBLAH

The astrolabe also helped determine ***the qiblah***. According to Muslim Heritage, some astrolabes had a ***sun-altitude grid*** and ***city lists*** for this purpose (Muslim Heritage).

SURAH AL-BAQARAH 2:144

قَدْ نَرَىٰ تَقَلُّبَ وَجْهِكَ فِي ٱلسَّمَآءِ ۖ فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضَىٰهَا ۚ فَوَلِّ وَجْهَكَ
شَطْرَ ٱلْمَسْجِدِ ٱلْحَرَامِ ۚ وَحَيْثُ مَا كُنتُمْ فَوَلُّوا۟ وُجُوهَكُمْ شَطْرَهُۥ ۗ وَإِنَّ ٱلَّذِينَ
أُوتُوا۟ ٱلْكِتَٰبَ لَيَعْلَمُونَ أَنَّهُ ٱلْحَقُّ مِن رَّبِّهِمْ ۗ وَمَا ٱللَّهُ بِغَٰفِلٍ عَمَّا يَعْمَلُونَ ﴿١٤٤﴾

We have certainly seen the turning of your face, [O Muhammad], toward the heaven, and We will surely turn you to a qiblah with which you will be pleased. So turn your face toward al-Masjid al-Haram. And wherever you [believers] are, turn your faces toward it [in prayer]. Indeed, those who have been given the Scripture well know that it is the truth from their Lord. And Allah is not unaware of what they do.

Translation: Sahih International — quran.com/2:144

The astrolabe helped fulfil the command: ***"wherever you [believers] are, turn your faces toward it"***. Tafsir Ibn Kathir 2:144.

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WAYS OF FINDING THE QIBLAH

METHOD	EXPLANATION
Astrolabe and tables	Calculating direction from a city's latitude and longitude.
The sun's shadow	On certain days, the sun is directly over the Ka'bah.
Compass	Used with tables of qiblah angles.
Phone apps	Using GPS and spherical calculation.

The tools change, but the aim stays the same: ***facing the House of Allah*** precisely as a sign of ***obedience***.

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THE NEW MOON AND FASTING

SURAH AL-BAQARAH 2:189

يَسْـَٔلُونَكَ عَنِ ٱلْأَهِلَّةِ ۖ قُلْ هِىَ مَوَٰقِيتُ لِلنَّاسِ وَٱلْحَجِّ ۗ وَلَيْسَ ٱلْبِرُّ بِأَن تَأْتُوا۟ ٱلْبُيُوتَ مِن ظُهُورِهَا وَلَٰكِنَّ ٱلْبِرَّ مَنِ ٱتَّقَىٰ ۗ وَأْتُوا۟ ٱلْبُيُوتَ مِنْ أَبْوَٰبِهَا ۚ وَٱتَّقُوا۟ ٱللَّهَ لَعَلَّكُمْ تُفْلِحُونَ ﴿١٨٩﴾

They ask you, [O Muhammad], about the new moons. Say, "They are measurements of time for the people and for Hajj." And it is not righteousness to enter houses from the back, but righteousness is [in] one who fears Allah. And enter houses from their doors. And fear Allah that you may succeed.

Translation: Sahih International — quran.com/2:189

The Prophet ﷺ was commanded to answer about the new moons: ***"They are measurements of time for the people and for Hajj"***. Tafsir Ibn Kathir 2:189.

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HADITH — SAHIH AL-BUKHARI, NO. 1909 (MUTTAFAQ ‘ALAYH)

حَدَّثَنَا آدَمُ، حَدَّثَنَا شُعْبَةُ، حَدَّثَنَا مُحَمَّدُ بْنُ زِيَادٍ، قَالَ سَمِعْتُ أَبَا هُرَيْرَةَ ـ رضى الله عنه ـ يَقُولُ قَالَ النَّبِيُّ صلى الله عليه وسلم أَوْ قَالَ قَالَ أَبُو الْقَاسِمِ صلى الله عليه وسلم «صُومُوا لِرُؤْيَتِهِ، وَأَفْطِرُوا لِرُؤْيَتِهِ، فَإِنْ غُبِّيَ عَلَيْكُمْ فَأَكْمِلُوا عِدَّةَ شَعْبَانَ ثَلاَثِينَ».

TRANSLATION:

Abu Hurayrah رضى الله عنه said: The Prophet ﷺ — or Abu al-Qasim ﷺ — said: **“Fast when you see it (the new crescent), and break your fast when you see it. If it is hidden from you, complete the count of Sha‘ban as thirty days.”**

CHAIN OF NARRATION: Narrated by Imam al-Bukhari: from Adam (ibn Abi Iyas), from Shu‘bah, from Muhammad ibn Ziyad, from Abu Hurayrah رضى الله عنه.

REFERENCE: Narrated by Imam al-Bukhari in Sahih al-Bukhari, Book of Fasting, Hadith No. 1909. Also narrated by Muslim (No. 1081).

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:1909

LESSONS FROM THIS HADITH

The Ramadan fast begins and ends with ***sighting the new moon***. Astronomy helps ***predict*** when the new moon can be seen, while ***sighting*** remains the basis in many countries.

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STRIVE FOR WHAT BENEFITS YOU

The skill of making astrolabes requires ***practice*** and ***patience***. The Messenger of Allah ﷺ said:

HADITH — SAHIH MUSLIM, NO. 2664

حَدَّثَنَا أَبُو بَكْرِ بْنُ أَبِي شَيْبَةَ، وَابْنُ، نُمَيْرٍ قَالاَ حَدَّثَنَا عَبْدُ اللَّهِ بْنُ إِدْرِيسَ، عَنْ رَبِيعَةَ بْنِ عُثْمَانَ، عَنْ مُحَمَّدِ بْنِ يَحْيَى بْنِ حَبَّانَ، عَنِ الأَعْرَجِ، عَنْ أَبِي هُرَيْرَةَ، قَالَ قَالَ رَسُولُ اللَّهِ صلى الله عليه وسلم « الْمُؤْمِنُ الْقَوِيُّ خَيْرٌ وَأَحَبُّ إِلَى اللَّهِ مِنَ الْمُؤْمِنِ الضَّعِيفِ وَفِي كُلٍّ خَيْرٌ احْرِصْ عَلَى مَا يَنْفَعُكَ وَاسْتَعِنْ بِاللَّهِ وَلاَ تَعْجِزْ وَإِنْ أَصَابَكَ شَىْءٌ فَلاَ تَقُلْ لَوْ أَنِّي فَعَلْتُ كَانَ كَذَا وَكَذَا. وَلَكِنْ قُلْ قَدَرُ اللَّهِ وَمَا شَاءَ فَعَلَ فَإِنَّ لَوْ تَفْتَحُ عَمَلَ الشَّيْطَانِ ».

TRANSLATION:

Abu Hurayrah رضى الله عنه said: The Messenger of Allah ﷺ said: **"The strong believer is better and more beloved to Allah than the weak believer, and in both there is good. Strive for what benefits you, seek the help of Allah, and do not be weak. If something befalls you, do not say: If only I had done such-and-such, it would have been such-and-such. Rather say: Allah has decreed, and what He wills He does. For "if only" opens the door to the work of Satan."**

CHAIN OF NARRATION: Narrated by Imam Muslim: from Abu Bakr ibn Abi Shaybah and Muhammad ibn 'Abdillah ibn Numayr, from 'Abdullah ibn Idris, from Rabi'ah ibn 'Uthman, from Muhammad ibn Yahya ibn Habban, from 'Abd al-Rahman al-A'raj, from Abu Hurayrah رضى الله عنه.

REFERENCE: Narrated by Imam Muslim in Sahih Muslim, Book of Divine Decree (Kitab al-Qadar), chapter on the command to be strong and to abandon weakness, Hadith No. 2664.

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

Source: https://sunnah.com/muslim:2664

LESSONS FROM THIS HADITH

Strive for what benefits you and ***do not give up***. Al-'Ijliyyah's dedication was ***valued*** so that her name was recorded in history.

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EXCELLENCE IN FINE WORK

Every line on an astrolabe had to be engraved ***very precisely***. A small error could make a reading of time or direction ***go astray***.

HADITH — SAHIH MUSLIM, NO. 1955

حَدَّثَنَا أَبُو بَكْرِ بْنُ أَبِي شَيْبَةَ، حَدَّثَنَا إِسْمَاعِيلُ ابْنُ عُلَيَّةَ، عَنْ خَالِدٍ الْحَذَّاءِ، عَنْ أَبِي قِلاَبَةَ، عَنْ أَبِي الأَشْعَثِ، عَنْ شَدَّادِ بْنِ أَوْسٍ، قَالَ ثِنْتَانِ حَفِظْتُهُمَا عَنْ رَسُولِ اللَّهِ صلى الله عليه وسلم قَالَ «إِنَّ اللَّهَ كَتَبَ الإِحْسَانَ عَلَى كُلِّ شَىْءٍ فَإِذَا قَتَلْتُمْ فَأَحْسِنُوا الْقِتْلَةَ وَإِذَا ذَبَحْتُمْ فَأَحْسِنُوا الذِّبْحَ وَلْيُحِدَّ أَحَدُكُمْ شَفْرَتَهُ فَلْيُرِحْ ذَبِيحَتَهُ».

TRANSLATION:

Shaddad ibn Aws رضى الله عنه said: Two things I memorised from the Messenger of Allah ﷺ; he said: **"Indeed Allah has prescribed excellence (ihsan) in everything.** So when you kill (where it is permitted), kill well; and when you slaughter, slaughter well. Let each of you sharpen his blade and spare his animal suffering."

CHAIN OF NARRATION: Narrated by Imam Muslim: from Abu Bakr ibn Abi Shaybah, from Isma'il ibn 'Ulayyah, from Khalid al-Hadhdha', from Abu Qilabah, from Abu al-Ash'ath as-San'ani, from Shaddad ibn Aws رضى الله عنه.

REFERENCE: Narrated by Imam Muslim in Sahih Muslim, Book of Hunting and Slaughter, Hadith No. 1955.

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

Source: https://sunnah.com/muslim:1955a

LESSONS FROM THIS HADITH

Allah has prescribed excellence in everything. A careful astrolabe maker practises ihsan — because the instrument is used for ***worship*** such as prayer and facing the qiblah.

THE WORK OF ONE'S OWN HANDS

Al-'Ijliyyah was ***a skilled craftswoman*** who earned her living by her skill. Islam honours the work of the hands:

HADITH — SAHIH AL-BUKHARI, NO. 2072

حَدَّثَنَا إِبْرَاهِيمُ بْنُ مُوسَى، أَخْبَرَنَا عِيسَى، عَنْ ثَوْرٍ، عَنْ خَالِدِ بْنِ مَعْدَانَ، عَنِ الْمِقْدَامِ ـ رضى الله عنه ـ عَنْ رَسُولِ اللَّهِ صلى الله عليه وسلم قَالَ « مَا أَكَلَ أَحَدٌ طَعَامًا قَطُّ خَيْرًا مِنْ أَنْ يَأْكُلَ مِنْ عَمَلِ يَدِهِ، وَإِنَّ نَبِيَّ اللَّهِ دَاوُدَ ـ عَلَيْهِ السَّلاَمُ ـ كَانَ يَأْكُلُ مِنْ عَمَلِ يَدِهِ ».

TRANSLATION:

Al-Miqdam رضى الله عنه narrated that the Messenger of Allah ﷺ said: **"No one has ever eaten food better than what he eats from the work of his own hands. And the Prophet of Allah David عَلَيْهِ السَّلَامُ used to eat from the work of his own hands."**

CHAIN OF NARRATION: Narrated by Imam al-Bukhari: from Ibrahim ibn Musa, from 'Isa ibn Yunus, from Thawr ibn Yazid, from Khalid ibn Ma'dan, from al-Miqdam ibn Ma'dikarib رضى الله عنه.

REFERENCE: Narrated by Imam al-Bukhari in Sahih al-Bukhari, Book of Sales (Kitab al-Buyu'), chapter on a man's earning and the work of his hands, Hadith No. 2072.

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:2072

LESSONS FROM THIS HADITH

The best food is what one earns by one's own hands. A skill — whether making astrolabes, sewing or repairing — is ***an honour***, for men and women.

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WOMEN AND KNOWLEDGE

Al-'Ijliyyah is proof that Muslim women took part in ***knowledge and craftsmanship*** from early times. In the time of the Messenger of Allah ﷺ, women themselves asked for special time to learn:

HADITH — SAHIH AL-BUKHARI, NO. 101

حَدَّثَنَا آدَمُ، قَالَ حَدَّثَنَا شُعْبَةُ، قَالَ حَدَّثَنِي ابْنُ الأَصْبَهَانِيِّ، قَالَ سَمِعْتُ أَبَا صَالِحٍ، ذَكْوَانَ يُحَدِّثُ عَنْ أَبِي سَعِيدٍ الخُدْرِيِّ، قَالَتِ النِّسَاءُ لِلنَّبِيِّ صلى الله عليه وسلم غَلَبَنَا عَلَيْكَ الرِّجَالُ، فَاجْعَلْ لَنَا يَوْمًا مِنْ نَفْسِكَ. فَوَعَدَهُنَّ يَوْمًا لَقِيَهُنَّ فِيهِ، فَوَعَظَهُنَّ وَأَمَرَهُنَّ، فَكَانَ فِيمَا قَالَ لَهُنَّ «مَا مِنْكُنَّ امْرَأَةٌ تُقَدِّمُ ثَلاَثَةً مِنْ وَلَدِهَا إِلاَّ كَانَ لَهَا حِجَابًا مِنَ النَّارِ». فَقَالَتِ امْرَأَةٌ وَاثْنَيْنِ فَقَالَ «وَاثْنَيْنِ».

TRANSLATION:

Abu Sa'id al-Khudri رضى الله عنه narrated: **The women said to the Prophet ﷺ: "The men have taken all your time from us, so appoint a day for us from yourself."** So he promised them a day on which he met them, advised them and instructed them. Among what he said to them was: "There is no woman among you who loses three of her children but they will be a shield for her from the Fire." A woman asked: "And two?" He said: "And two."

CHAIN OF NARRATION: Narrated by Imam al-Bukhari: from Adam, from Shu'bah, from Ibn al-Asbahani, from Abu Salih Dhakwan, from Abu Sa'id al-Khudri رضى الله عنه.

REFERENCE: Narrated by Imam al-Bukhari in Sahih al-Bukhari, Book of Knowledge, Chapter on Setting a Special Day for Teaching Women, Hadith No. 101.

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:101

LESSONS FROM THIS HADITH

The Messenger of Allah ﷺ ***granted the women's request*** and set a special day to teach them. Knowledge is the right of ***both men and women***.

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SURAH AL-AHZAB 33:35

إِنَّ ٱلْمُسْلِمِينَ وَٱلْمُسْلِمَٰتِ وَٱلْمُؤْمِنِينَ وَٱلْمُؤْمِنَٰتِ وَٱلْقَٰنِتِينَ وَٱلْقَٰنِتَٰتِ
وَٱلصَّٰدِقِينَ وَٱلصَّٰدِقَٰتِ وَٱلصَّٰبِرِينَ وَٱلصَّٰبِرَٰتِ وَٱلْخَٰشِعِينَ وَٱلْخَٰشِعَٰتِ
وَٱلْمُتَصَدِّقِينَ وَٱلْمُتَصَدِّقَٰتِ وَٱلصَّآئِمِينَ وَٱلصَّآئِمَٰتِ وَٱلْحَٰفِظِينَ فُرُوجَهُمْ
وَٱلْحَٰفِظَٰتِ وَٱلذَّٰكِرِينَ ٱللَّهَ كَثِيرًا وَٱلذَّٰكِرَٰتِ أَعَدَّ ٱللَّهُ لَهُم مَّغْفِرَةً وَأَجْرًا
عَظِيمًا ﴿٣٥﴾

Indeed, the Muslim men and Muslim women, the believing men and believing women, the obedient men and obedient women, the truthful men and truthful women, the patient men and patient women, the humble men and humble women, the charitable men and charitable women, the fasting men and fasting women, the men who guard their private parts and the women who do so, and the men who remember Allah often and the women who do so - for them Allah has prepared forgiveness and a great reward.

Translation: Sahih International — quran.com/33:35

Allah mentions men and women ***together*** in every good quality, including ***"the charitable men and charitable women"***. Tafsir Ibn Kathir 33:35.

WOMEN IN KNOWLEDGE AND CRAFT	EXAMPLE
Narrators of Hadith	'A'ishah رضى الله عنها and many women scholars after her.
Builders of institutions	According to tradition, Fatimah al-Fihri (Book 38).
Makers of scientific instruments	Al-'Ijliyyah in Aleppo.
Physicians and midwives	Women of the Banu Zuhr family (Book 30).

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INHERITED KNOWLEDGE

Al-'Ijliyyah inherited knowledge from her father and her teacher. Knowledge that is inherited and taught brings ***great reward***:

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

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LESSONS FROM THIS HADITH

Whoever travels a path in search of knowledge, Allah makes easy for him a path to Paradise. Learning a beneficial skill is also part of the path of knowledge.

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HADITH — SAHIH AL-BUKHARI, NO. 73

حَدَّثَنَا الْحُمَيْدِيُّ، قَالَ حَدَّثَنَا سُفْيَانُ، قَالَ حَدَّثَنِي إِسْمَاعِيلُ بْنُ أَبِي خَالِدٍ، عَلَى غَيْرِ مَا حَدَّثَنَاهُ الزُّهْرِيُّ، قَالَ سَمِعْتُ قَيْسَ بْنَ أَبِي حَازِمٍ، قَالَ سَمِعْتُ عَبْدَ اللَّهِ بْنَ مَسْعُودٍ، قَالَ قَالَ النَّبِيُّ صلى الله عليه وسلم « لاَ حَسَدَ إِلاَّ فِي اثْنَتَيْنِ رَجُلٌ آتَاهُ اللَّهُ مَالاً فَسُلِّطَ عَلَى هَلَكَتِهِ فِي الْحَقِّ، وَرَجُلٌ آتَاهُ اللَّهُ الْحِكْمَةَ، فَهْوَ يَقْضِي بِهَا وَيُعَلِّمُهَا ».

TRANSLATION:

‘Abdullah ibn Mas‘ud رضى الله عنه said: The Prophet ﷺ said: **“There is no envy except in two cases: a man whom Allah has given wealth and he spends it in the way of truth, and a man whom Allah has given wisdom (knowledge) and he judges by it and teaches it.”**

CHAIN OF NARRATION: Narrated by Imam al-Bukhari: from al-Humaidi, from Sufyan ibn ‘Uyainah, from Isma‘il ibn Abi Khalid, from Qais ibn Abi Hazim, from ‘Abdullah ibn Mas‘ud رضى الله عنه.

REFERENCE: Narrated by Imam al-Bukhari in Sahih al-Bukhari, Book of Knowledge, chapter on envying in knowledge and wisdom, Hadith No. 73. Also narrated by Muslim (No. 816).

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:73

LESSONS FROM THIS HADITH

There is no envy except in two things: one who spends his wealth in the cause of truth, and one given wisdom who ***teaches it***. Knowledge that is taught keeps bringing benefit from generation to generation.

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FROM ASTROLABE TO SATELLITE

Today, the work once done with an astrolabe is done by ***digital clocks***, ***computers*** and ***GPS satellites***. The GPS system has a core of at least ***24 satellites*** (GPS.gov).

HISTORY NOTE: THE ASTEROID AL-'IJLIYA

In ***1990***, asteroid ***7060 al-'Ijliya*** was discovered by Henry E. Holt at Palomar Observatory and named in her honour. She also inspired a character in the novel ***Binti*** (2015).

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THEN AND NOW

TASK	ASTROLABE AND MODERN TOOLS
Telling the time	Astrolabe: the sun's altitude. Modern: atomic clocks and phones.
Finding direction	Astrolabe: stars and tables. Modern: compass and GPS.
Prayer times	Astrolabe: prayer lines. Modern: timetables and apps.
Star positions	Astrolabe: the rete. Modern: telescopes and software.

Technology changes, but the spirit is the same: ***understanding the sky*** to ***ease worship and life***.

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ESTABLISHED REPORTS AND POPULAR STORIES

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

STORIES AND THEIR STATUS

POPULAR CLAIM	STATUS
A woman named al-'Ijliyyah made astrolabes for Sayf ad-Dawlah.	Established in al-Fihrist by Ibn an-Nadim (987 CE).
She and her father were pupils of Nastulus.	Established in al-Fihrist.
Her real name was "Mariam".	Not found in the source. The name was added in modern popular writing.
She invented new and complex astrolabe designs.	No evidence. The source only says she was an astrolabe maker.
An astrolabe made by her survives today.	None is known. What survives are astrolabes by her teacher, Nastulus.
An asteroid is named after her.	Established. Asteroid 7060 al-'Ijliya (discovered 1990).

REFLECTION — HONOURING WITHOUT EXAGGERATING

One line in al-Fihrist is enough to prove that ***Muslim women took part in science and craftsmanship*** in the 10th century CE. We need not add stories that have no source.

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LESSONS AND CONCLUSION

LESSONS FROM THIS EBOOK

First: The stars are adornment and guidance made by Allah (6:97; 67:5).

Second: The sun and moon move by calculation (55:5; 10:5; 21:33).

Third: Be people of understanding who remember and reflect (51:47; 3:190–191).

Fourth: Leaders who value knowledge produce civilisation.

Fifth: Learn from skilled teachers.

Sixth: Keep prayer at its proper time (Sahih al-Bukhari 527; Sahih Muslim 612).

Seventh: Face the qiblah and watch for the new moon (2:144; 2:189; Sahih al-Bukhari 1909).

Eighth: Strive for what benefits you (Sahih Muslim 2664).

Ninth: Do fine work with excellence (Sahih Muslim 1955).

Tenth: Work with the hands is honourable (Sahih al-Bukhari 2072).

Eleventh: Knowledge is the right of men and women; inherit it and teach it (Sahih al-Bukhari 101, 73; Sahih Muslim 2699; 33:35).

Twelfth: Be honest about what we know and do not know.

CONCLUSION

The dates of al-'Ijliyyah's birth and death ***are unknown***. The next book of **Tracing the Scholars of Islam**, in sha Allah, will tell the story of ***Hamzah Fansuri***, the Sufi scholar and poet of the Malay world. Wallahu a'lam.

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GLOSSARY AND REFLECTION QUESTIONS

GLOSSARY

TERM	MEANING
Astrolabe	A brass instrument for reading star positions, time and direction.
Mater	The base plate of the astrolabe.
Rete	A pierced plate showing the stars.
Alidade	A sighting rule for measuring altitude.
Stereographic projection	A method of drawing the celestial sphere on a flat surface.
Latitude	Distance north or south of the equator.
Al-Fihrist	A catalogue of books and scholars by Ibn an-Nadim.

REFLECTION QUESTIONS

1. What roles do the stars play according to verses 6:97 and 67:5?

2. What are the main parts of an astrolabe?

3. How did the astrolabe help Muslims in worship?

4. Why does the name “Mariam” need checking?

5. What does al-‘Ijliyyah’s story teach girls who are studying today?

SUGGESTED ACTIVITIES

Activity 1: Watch the shadow of a stick at Dhuhr and ‘Asr. Compare their lengths.

Activity 2: Draw a simple diagram of an astrolabe and label the mater, rete, plate and alidade.

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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 .

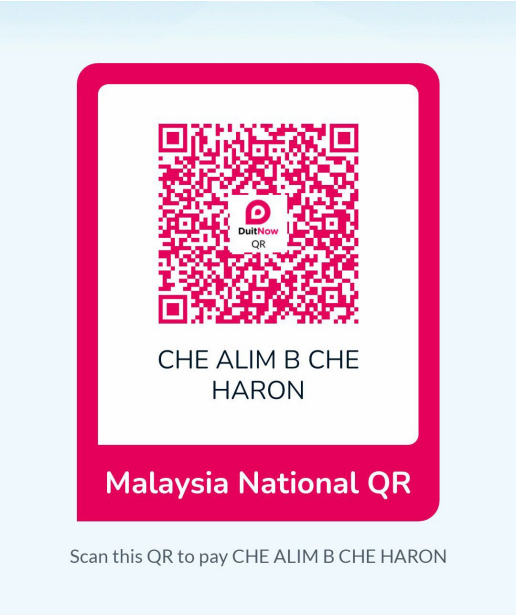
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GRADE: SAHIH — contained in Sahih Muslim.

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

JAZAKUMULLAHU KHAIRAN KATHIRA

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