

# ISLAMIC HISTORY AND SCIENCE



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# PROPHECY AND TIMELINE OF ISLAMIC HISTORY



- ‘The Messenger of Allah, may peace and blessings be upon him said, ‘[my] *nabūwwah*(prophethood) shall remain among you as Allah wills it to remain, and then Allah shall cause it to end when He wills to end it. Then will remain Prophetic Caliphate (*khilāfah ‘alā minhājin nabūwwah*) and it will end. Then shall come despotic monarchy (*mulkan ‘ādhan*) and it will end. Then will appear coercive monarchy (*mulkan jabrīyyah*) and it will end. Then will appear Prophetic Caliphate (*khilāfah ‘alā minhājin nabūwwah*) again. Then the Prophet remained silent.”

- 1.) Rāshidūn Caliphate (632 CE – 661 CE)
- 2.) Arab Period (661 CE – 950 CE)
- 3.) Seljuq Period (950 CE – 1250 CE)
- 4.) Mongol Period (1250 CE – 1500 CE)
- 5.) Regional Dynastic Period (1500 CE – 1908 CE)
- 6.) Re-establishment of the Rāshidūn Caliphate (1908 CE – present)

# 'ABBASID EMPIRE



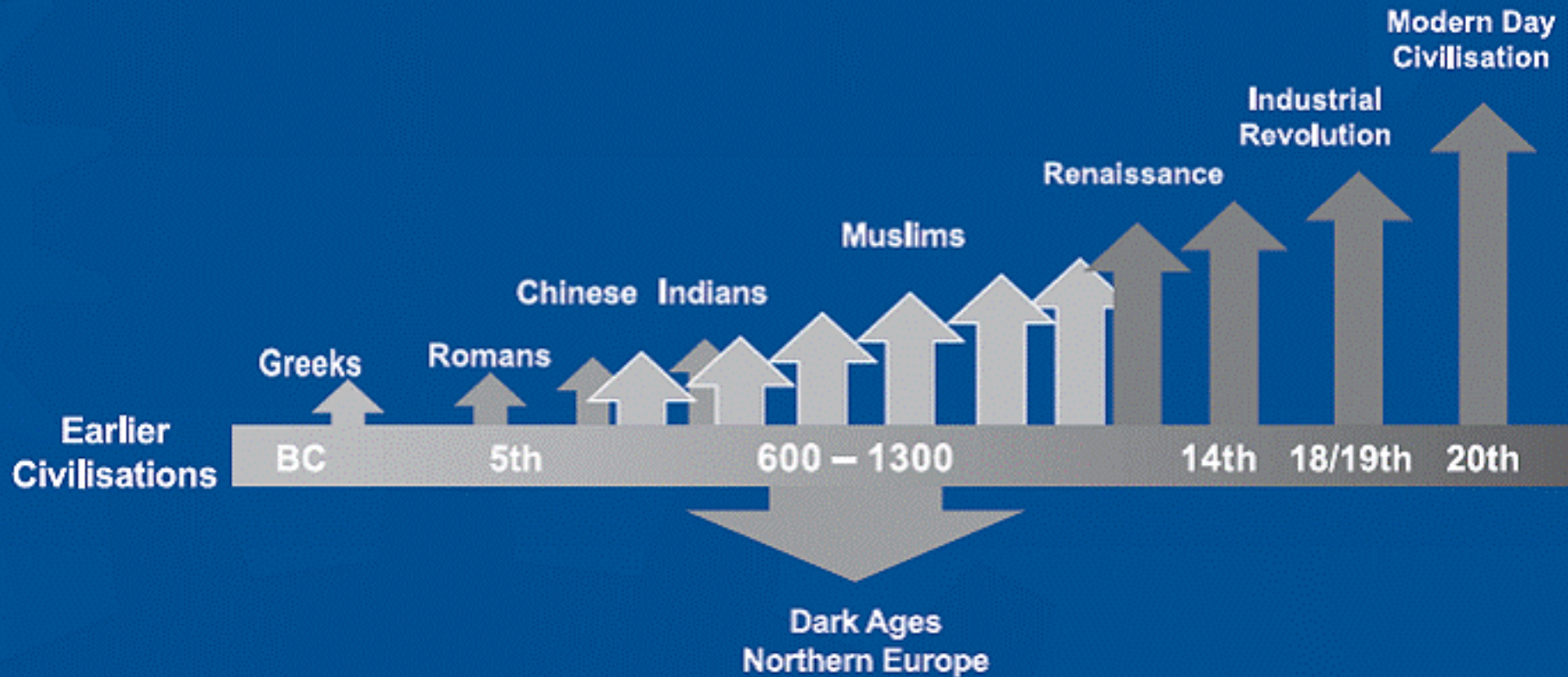
# KHALIFA-TUL-MASIH II (RA) ON THE 'ABBASID PERIOD

- *“The achievements in the arts and sciences by the government of Banu ‘Abbas are a happy memory for all Muslims...I can speak for myself and definitely state that in my childhood Baghdad and Basra were far more alluring and charming than London and Paris because they were familiar to me right from the start.” (Al-Fazl, 27 May 1941, pg 2)*



# HISTORY OF SCIENCE

**History of Science and Civilisation as should be taught:**



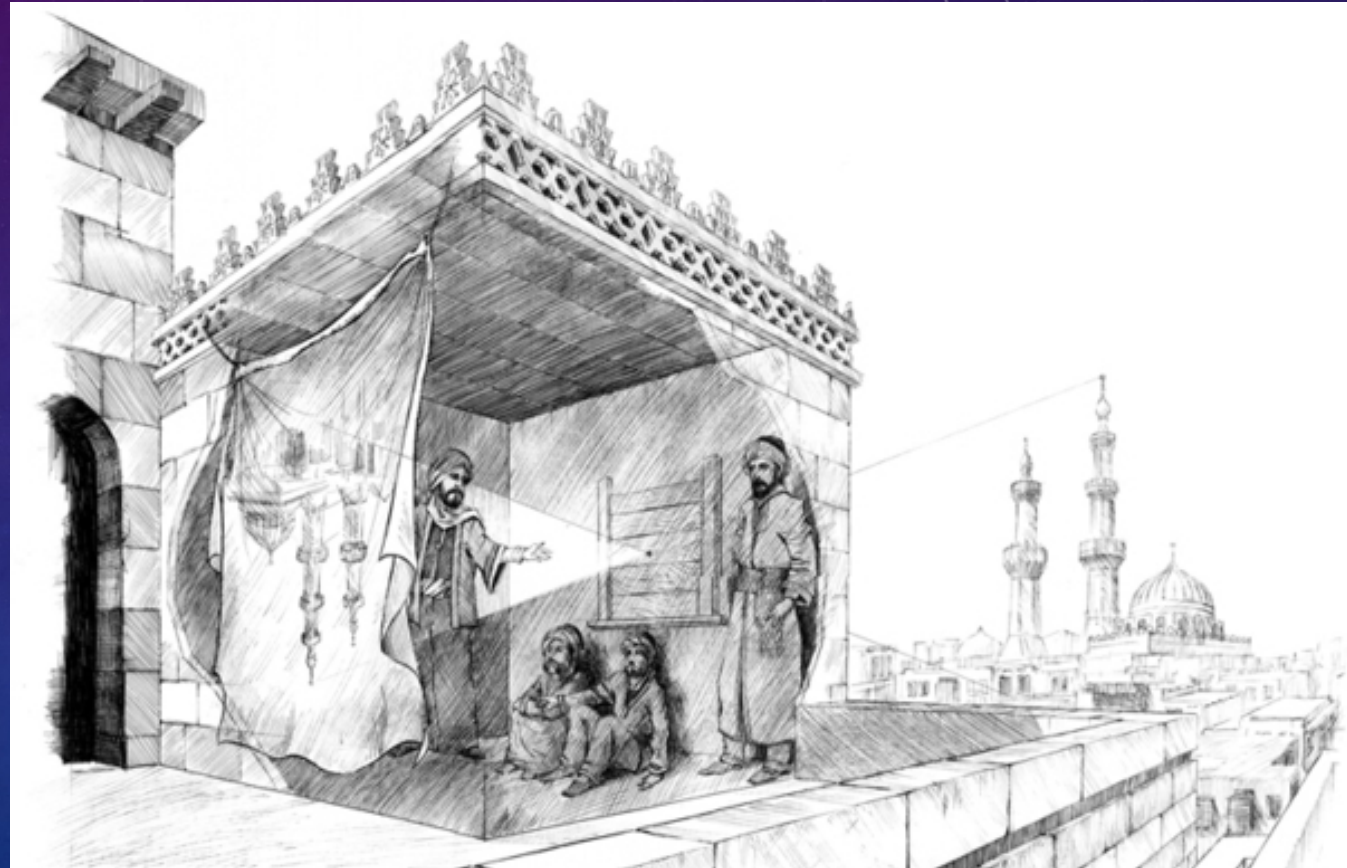
# FATIMA AL-FIHRI AND AL-QARAWIYYIN

- In 859 CE, Fatima al-Fihri, the daughter of a merchant from Tunisia, established the University of al-Qarawiyyin in Fes, Morocco
- Al-Qarawiyyin is the oldest existing, continually operating and the first degree awarding educational institution in the world according to UNESCO and Guinness World Records
- A notable alumnus from al-Qarawiyyin was Ibn Khaldun



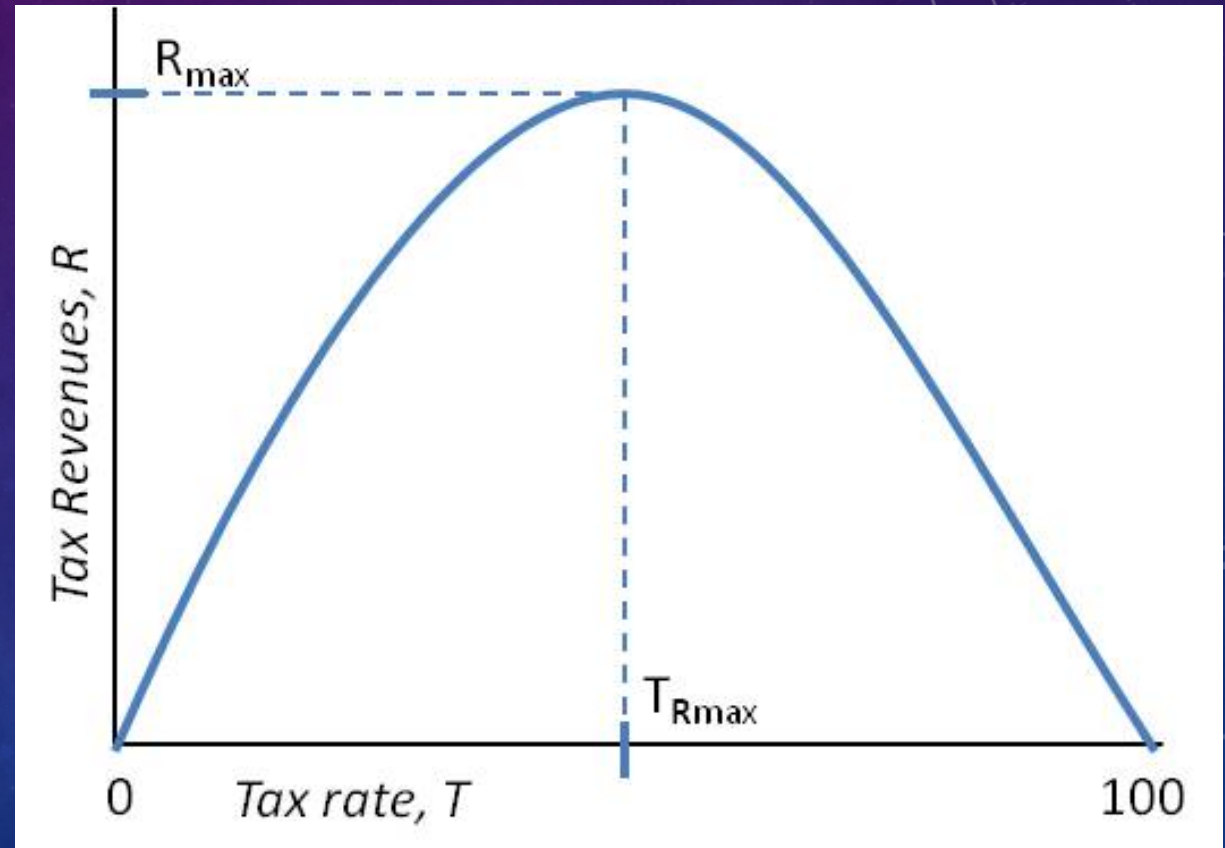
# IBN AL-HAYTHAM, THE FIRST SCIENTIST

- In medieval Europe, he was honored as Ptolemaeus Secundus ("Ptolemy the Second") or simply called "The Physicist"
- Lived under the Isma'ili Fatimid Caliphate of Egypt
- His main work was *Kitab al-Manazir (Book of Optics)*
- Believed all objects emit light which is transduced through the eyes
- Invented the *camera obscura*, the device that forms the basis behind photography
- Founder of the experimental scientific method
- "The seeker after truth is not one who studies the writings of the ancients and, following his natural disposition, puts his trust in them but rather the one who suspects his faith in them and questions what he gathers from them, the one **who submits to argument and demonstration** and not the sayings of human beings whose nature is fraught with all kinds of imperfection and deficiency." - Ibn al-Haytham



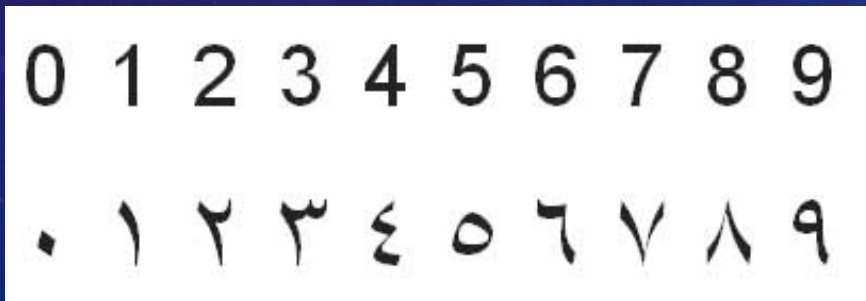
# IBN KHALDUN, FOUNDER OF MODERN SOCIOLOGY AND ECONOMICS

- Born in Tunisia to a family of Andalusian Arab Muslims in 1332 CE
- Regarded to be among the founding fathers of modern sociology, historiography, and economics
- He is best known for his book *The Muqaddimah* (known as Prolegomena in Greek) which describes history and sociology
- In economics, the Laffer curve is one possible representation of the relationship between rates of taxation and the hypothetical resulting levels of government revenue; attributed to Ibn Khaldun by Arthur Laffer, its founder
- "Crafts improve and increase when the demand for their products increases" – Ibn Khaldun



# ARABIC NUMERALS AND AL-KHAWARIZMI

- Persian mathematician working at the House of Wisdom in Baghdad in the ninth century
- Discovered algebra which is from the Arabic word *al-jabr* meaning "restoring," which is how al-Khwarizmi referred to the operation of removing roots and squares from a quadratic equation by adding the same quantity to each side of the equation
- Also discovered modern Hindu-Arabic numbers derived from Indian mathematics and the number 0



## Comparing Number Systems

Roman Numerals	Arabic Numerals
I	1
II	2
III	3
IV	4
V	5
VI	6
VII	7
VIII	8
IX	9
X	10
XI	11
XII	12
XIII	13
XIV	14
XV	15
XVI	16
XVII	17
XVIII	18
XIX	19
XX	20

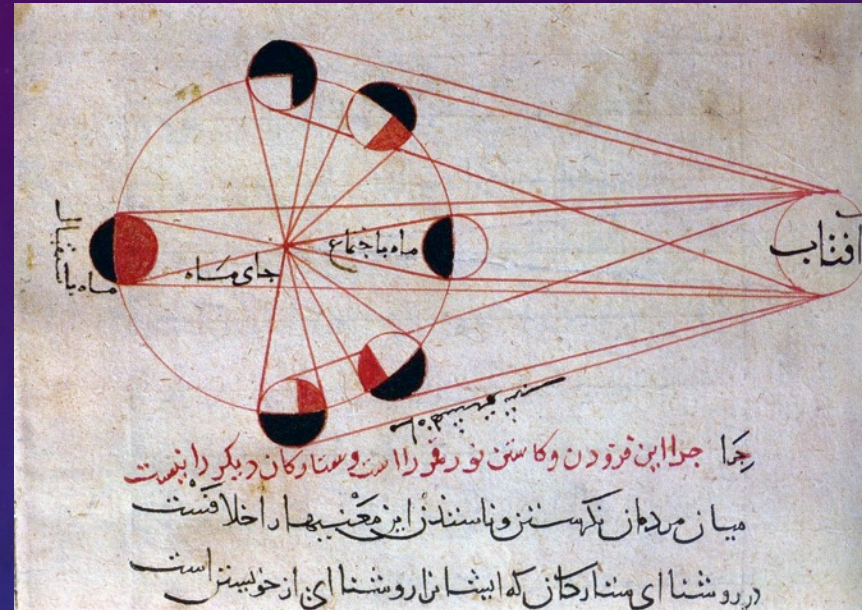
$$XXII + XXXIV = ?$$

$$\begin{array}{r} 22 \\ +34 \\ \hline ? \end{array}$$

Which one is easy to calculate?

# MUSLIM ASTRONOMY AND ITS INFLUENCES ON COPERNICUS

- A significant number of stars in the sky, such as Aldebaran and Altair, and astronomical terms such as alidade, azimuth, and almucantar, are still referred to by their Arabic names
- Copernicus' lunar model was identical to the lunar model of Arab astronomer Ibn al-Shatir, who also led to Copernicus' heliocentric model
- Al-Biruni stated that the earth rotates on an axis



- Astrolabes were developed in the Islamic world from its Ancient Greek origins, by 8<sup>th</sup> century mathematician Muhammad al-Farazi, where he added circles indicating azimuths on the horizon

It had many uses include locating and predicting the positions of the Sun, Moon, planets, and stars in order to:

- Keep time in general and predict prayer timings for Muslims
- Navigate on seas and land

# AL-JABIR IBN HAYYAN, THE FOUNDER OF CHEMISTRY

- Lived under the Ummayyad Caliphate of Damascus in the 700's CE
- Considered the founder of chemistry, and was also a pharmacist, physician, and engineer
- The word "chemistry" itself is from the Arabic *al-kimiya*, and the word "alkali" meaning base, from *al-qaly*
- Invented chemical laboratory equipment such as the retort and alembic (from the Arabic *al-anbīq*)
- Described such things as
  - Crystallisation
  - Distillation
  - Citric acid from lemons
  - Acetic acid from vinegar
  - The chemical elements antimony (metalloid element), sulfur, and mercury
  - The idea of chemical compounds (e.g. salt composed of sodium and chlorine)
  - Supposedly invented a paper that was fire resistant and an ink that could be read at night



# EVOLUTIONARY BIOLOGY AND AL-JAHIZ

- Was a biologist and author who lived in Basra, Iraq during the 'Abbasid empire; was of black African and Arab ancestry
- His book *Kitāb al-Hayawān* (Book of Animals) described the theory of natural selection (as did Ibn Khaldun) centuries before Darwin:
  - “Animals engage in a struggle for existence; for resources, to avoid being eaten and to breed. Environmental factors influence organisms to develop new characteristics to ensure survival, thus transforming into new species. Animals that survive to breed can pass on their successful characteristics to offspring” – al-Jahiz



# MEDICINE IN THE ISLAMIC WORLD

- "There is no disease that Allah has created, except that He also has created its remedy." - Prophet Muhammad (sa)
- The medieval Islamic world expanded the practice of surgery and dentistry, and the study of human anatomy/physiology
- Hospitals were developed by early 700's, many of them with psychiatric wards and special wards for women, and pharmacies developed as well
- Ibn Sina, was one of the most famous physicians of history, whose *Canon of Medicine* was used as a university textbook in Europe for 700 years
- Al-Razi was a physician who discovered the cures for smallpox and measles, and first used anaesthetic (opium) during surgery
- Al-Zahrawi is credited as the father of modern surgery, who invented more than 200 surgical instruments



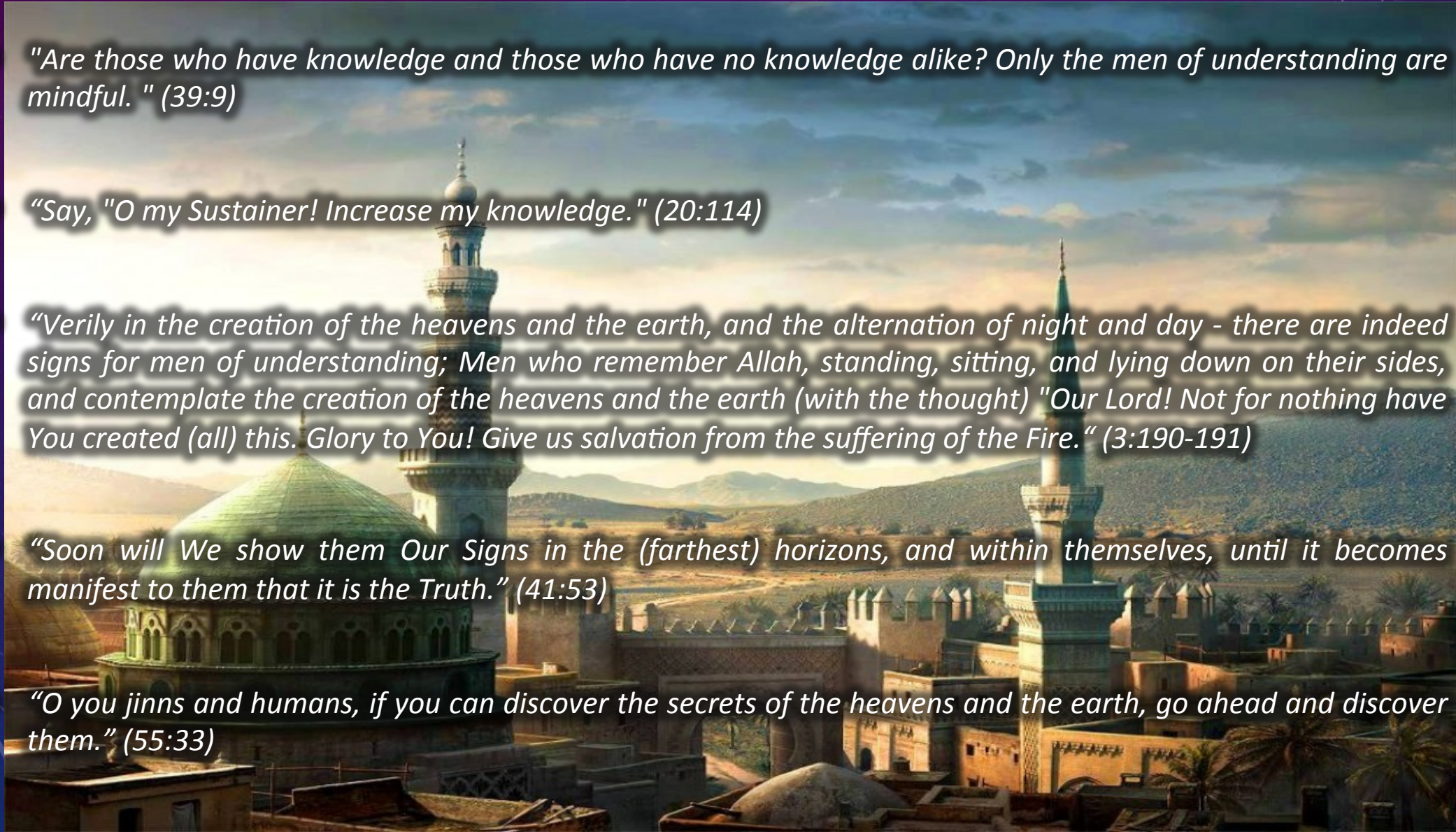
# MUSLIM PHILOSOPHERS AND THE TRANSMISSION OF GREEK PHILOSOPHY TO THE MODERN WORLD

- Al-Farabi was a commentator on the philosopher works of Aristotle
- Ibn Rushd (known as Averroes in Latin Europe) was a famous Andalusian lawyer and physician, whose fame stems from his commentary on Aristotle's works and his philosophical school of thought known as *Averroesism*
- Muslims established the *Bayt al-Hikmah*, which was an astronomical observatory, library, and translation centre
  - Muslims translated thousands of works from Greek and Sanskrit into Arabic, which is why we have the works of the Greek philosophers Plato and Aristotle today as these Arabic texts were later translated into Latin by Europe
- The Mu'tazilites were a group of Muslim rationalists who sought to philosophically understand the Qur'an through reason and logic



# IMPORTANCE OF KNOWLEDGE IN ISLAM – QUR'AN

- *"Are those who have knowledge and those who have no knowledge alike? Only the men of understanding are mindful." (39:9)*
- *"Say, "O my Sustainer! Increase my knowledge." (20:114)*
- *"Verily in the creation of the heavens and the earth, and the alternation of night and day - there are indeed signs for men of understanding; Men who remember Allah, standing, sitting, and lying down on their sides, and contemplate the creation of the heavens and the earth (with the thought) "Our Lord! Not for nothing have You created (all) this. Glory to You! Give us salvation from the suffering of the Fire." (3:190-191)*
- *"Soon will We show them Our Signs in the (farthest) horizons, and within themselves, until it becomes manifest to them that it is the Truth." (41:53)*
- *"O you jinns and humans, if you can discover the secrets of the heavens and the earth, go ahead and discover them." (55:33)*

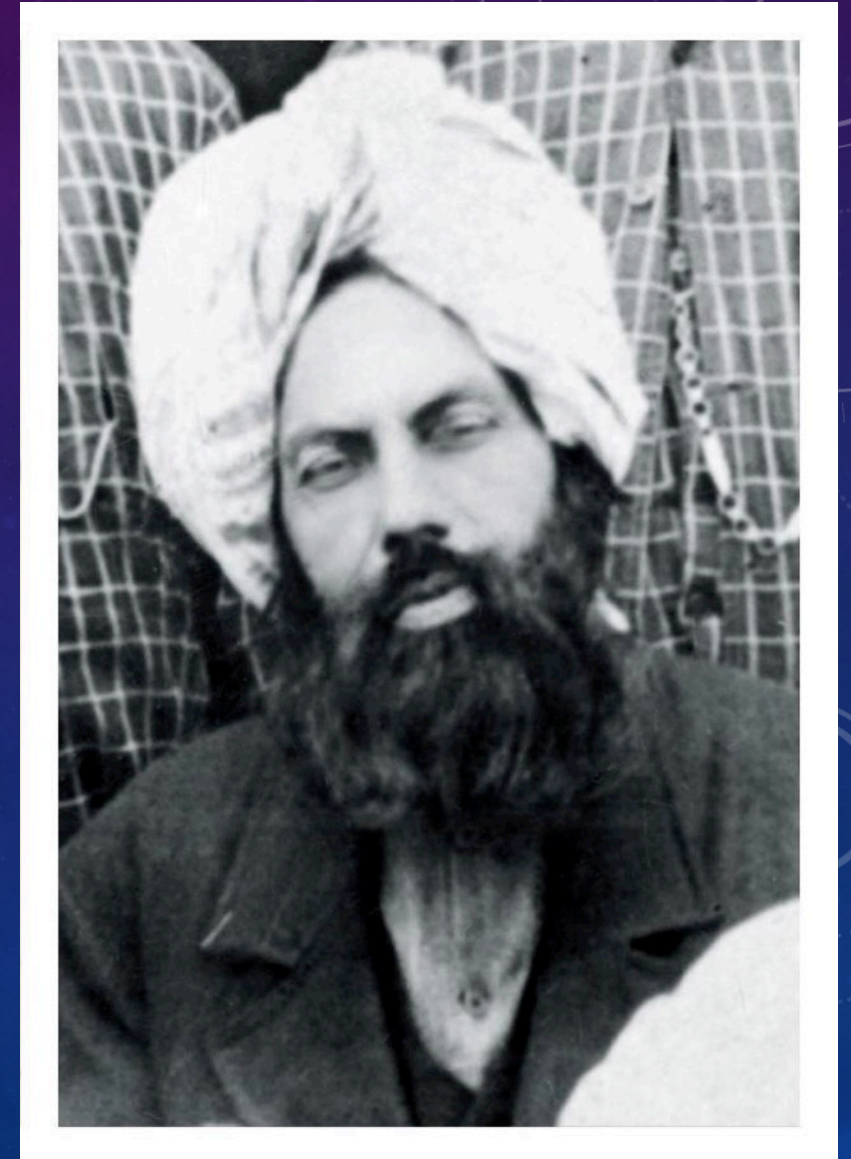


# IMPORTANCE OF KNOWLEDGE IN ISLAM – PROPHET MUHAMMAD<sup>SA</sup>

- **"Seek knowledge "even though it be in China.""**
- **"The acquisition of knowledge is compulsory for every Muslim, whether male or female."**
- **"The ink of the scholar is more sacred than the blood of the martyr."**
- **"Seek knowledge from the cradle to the grave."**
- **"Acquire knowledge: it enables its possessor to distinguish right from the wrong, it lights the way to heaven; it is our friend in the desert, our society in solitude, our companion when friendless - it guides us to happiness; it sustains us in misery; it is an ornament among friends and an armor against enemies."**

# IMPORTANCE OF KNOWLEDGE IN ISLAM – PROMISED MESSIAH<sup>AS</sup>

- *"It is very essential that in order to serve Islam, you should acquire the knowledge of the worldly sciences as well - the latest ones for that matter. And you should struggle for this purpose. At the same time, I am giving a warning that those who have striven to acquire one-sided knowledge and do not have the time or mind to spend some time with spiritual people - nor do they have any light of spirituality in themselves - they have stumbled and gone far away from Islam."*
- *"My Community shall be a lighthouse so high as to illumine the four corners of the world. The members of my Jama'at shall serve as models of Islamic blessings. My true followers shall excel every other people. There shall always rise among them, till the Judgement Day, personages who will be the chosen ones of God in every respect. So has the Almighty decreed. He does as He wills."*



# PEDARAM SULTAN BOOD?

- *There is a Persian proverb “Pedaram Sultan Bood” which means “My father was a king”. It is used for people who are proud of their forefathers’ accomplishments but do not have any merit of their own. We must not be such people. It is our responsibility to excel in sciences to restore this lost glory*