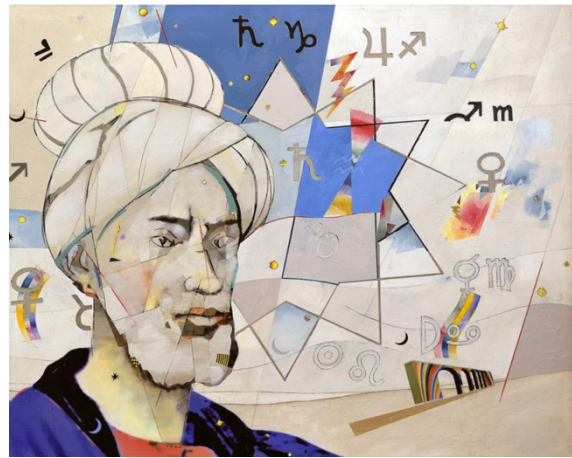


The Golden Age of Islamic Humanism, 900-1100.

A Golden Age of Science

In the period 800-1100 there was a remarkable flowering of science, poetry and humanist philosophy in the Islamic world, especially central Asia, in cities which are now part of Uzbekistan and Afghanistan. Central Asia was a center of the caravan trade. Ideas from Europe, China and India combined to produce dramatic advances in science and a rich cosmopolitan culture, particularly noted for poetry.

Central Asian mathematicians combined the logical geometry of Euclid and other Greeks with the decimal number system developed in India and published the results using the new technology of paper, which they had learned from China. Al-Kharizmi (780-850), who personally developed the techniques for solving equations taught in high school today, summarized the new discoveries in his book al-Jabr. Thanks to the low cost of paper, relative to parchment or papyrus, his book was widely distributed, even in Europe, where "al-Jabr" became written as "algebra" and Al-Kharizmi's name became the word "algorithm".



Omar Khayyam, astronomer and poet

Physicians and chemists like al-Razi (Rhazes) (864-935) and Ibn Sina (Avicenna) (980-1037) greatly advanced medical science. Ibn Sina's textbook, The Canon of Medicine (1025), was the standard medical textbook in Europe from around 1300 to 1600.

The word "alcohol" comes from the Arabic "al-kuhul". Al-kuhul was an important discovery of the science of "al-kimiya", which Europeans wrote as "Alchemy", eventually dropping the "Al" to call the subject "Chemistry". Islamic astronomy is reflected in the fact that most stars in the sky are still referred to by their Arabic names.

Rationalism and Religion

Being good humanists, the scholars of the Golden Age had lots of opinions about religion. The physician al-Razi (Rhazes) was particularly outspoken, writing pamphlets whose titles include:

Prophets' Fraudulent Tricks
The Stratagems of Those Who Claim to Be Prophets
On the Refutation of Revealed Religions.



al-Razi, physician

Razi was very clear,

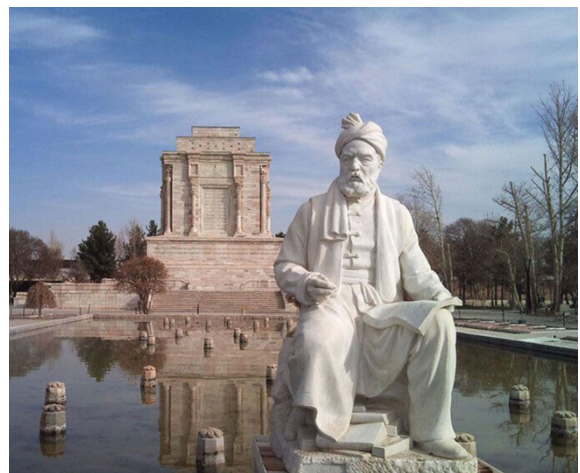
If the people of [a given] religion are asked about the proof for the soundness of their religion, they flare up, get angry and spill the blood of whoever confronts them with this question. They forbid rational speculation, and strive to kill their adversaries. This is why truth became thoroughly silenced and concealed.

It is striking that comments like that could be published in Iran and Afghanistan in 900 AD. Certainly they would not be remotely acceptable in those countries today. But most Golden Age writers were more moderate than Razi, believing that Islam and scientific inquiry were compatible.

Poetry

The Golden Age of science was also a Golden Age of Poetry. Most Persians see Ferdowsi (921-1035) as the greatest of all Persian poets. Ferdowsi's Shahnameh, or Book of Kings, is an epic account of Persian history up until the Islamic conquest around 650. The opening chapter includes a section "In Praise of Wisdom" which explicitly endorses gaining wisdom from a wide variety of sources, a core humanist and liberal value.

God created thee
To know appearance and reality.
Let wisdom be thy minister to fend
Thy mind from all that self-respect should shun,
Learn by the words of sages how to wend
Thy way, roam earth, converse with every one ;
And when thou hearest any man of lore
Discourse, sleep not, increase thy wisdom's store ;
But mark, while gazing at the boughs of speech,
How much the roots thereof are out of reach.



Ferdowsi's Tomb in Iran

In Ferdowsi's time Afghanistan, where he lived, had sophisticated followers of ancient Greek philosophy, Zoroastrianism, Buddhism, Hinduism, Judaism, Christianity, and both Sunni and Shia Islam. To "converse with every one" was quite a project.

Scientific Method

To a modern scientist, the most striking thing about Avicenna et al. is not the content of their science but the fact that they were questioning authority and testing ideas with experiments. Al-Haytham (965-1045), who developed a mathematical theory of optics, wrote,

The seeker after truth is not one who studies the writings of the ancients...and puts trust in them, but rather the one who suspects their own faith in them and questions what one gathers from them... Thus the duty of the person who investigates the writings of scientists, if learning the truth

is the goal, is to turn into the enemy of all that one reads, and, applying one's mind to the core and margins of its content, attack it from every side."

In a 2015 article modern Islamic physicist Rasaulah Ansari, after quoting the above, commented,

I would like to conclude on a despairing note by pointing to the irony of Islamic Middle ages in which even a practical science of optics remained in oblivion, despite thoroughly researched by Ibn al-Haytham. Strangely enough only one commentary on Ibn al-Haytham's Optics was written in three centuries.

On the other hand, during the so-called 'dark ages' in Europe, Ibn al-Haytham's optical Opus was immortalised by the English poet Geoffrey Chaucer (1320-1400) in "The Squire's Tale)" (Canterbury Tales):

Chaucer's squire is a pretentious young man who want to show that he is up to date on the latest trends in Renaissance Italy.

"They spoke of Alhazen and Vitello,
And Aristotle, who wrote, in their lives,
On strange mirrors and optical instruments."

Alhazen is a European spelling of al-Haytham. Vitello was a Polish friar whose book, *Perspectiva*, based on al-Haytham's work, provided the mathematical basis for the use of perspective by painters of the Renaissance.

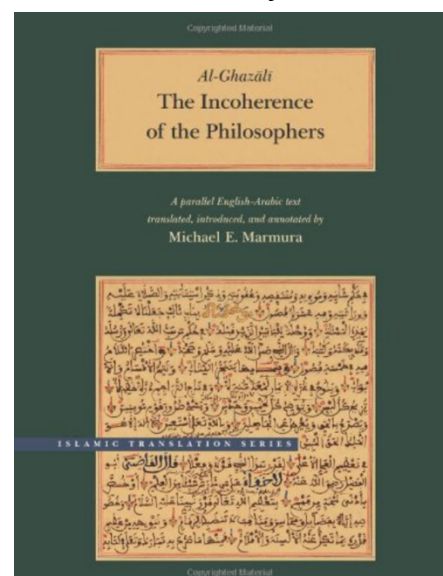
What happened that the Islamic world turned its back on science and humanism generally?

Al-Ghazali (1056-1111)

The collapse of Islamic humanism is often attributed to one individual scholar, al-Ghazali, who lived about a hundred years after Ibn Sina, Ferdowsi and al-Haytham. Al-Ghazali, who was extremely well educated in Greek philosophy, decided that Greek philosophy, and indeed all scientific thought, was inconsistent and should therefore be abandoned in favor of direct devotion to God as revealed by the Quran. He expressed this view in a well-argued book, *The Incoherence of the Philosophers*. It is difficult to believe that one book, no matter how persuasive, could convince a great civilization to abandon science for a thousand years. But that appears to be what happened.

In the first lines of his preface, al-Ghazali makes clear his purpose: to attack precisely the sort of questioning al-Haytham believed necessary.

I have seen a group who, believing themselves in possession of a distinctiveness from companion and peer by virtue of a superior quick wit and intelligence, have rejected the Islamic duties regarding acts of worship, disdained religious writs pertaining to the office of prayer and the avoidance of prohibited things, belittled the devotion and ordinances prescribed by the divine



law. ... On the contrary, they have entirely cast off the reins of religion. The source of their unbelief is their hearing high-sounding names like "Socrates," "Hippocrates," "Plato" and "Aristotle." [Influenced by such writers, they deny] revealed laws and religious confessions and [reject] the details of religious and sectarian [teachings,] believing them to be man-made laws and embellished tricks.

Al-Ghazali concludes that people who believe in science are apostates to Islam. Ghazali is not shy about the required punishment, execution.

The meaning of "repentance" of an apostate is his abandoning of his inner religion. [But] the secret apostate does not give up his inner confessions when he professes the words of the shahada [Confession of Faith]. He may [still] be killed for his unbelief because we are convinced that he stays an unbeliever who sticks to his unbelief.

Omar Khayyam

For the scientists of al-Ghazali's time, al-Ghazali's huge popularity was depressing indeed. One such scientist was Omar Khayyam (1048-1131) who had the misfortune to live just as the Golden Age was dying.

His best solution to the problem of al-Ghazali's popularity was to get plastered.

Now, when only the name of happiness is left,
No ripe comrade remaining but the rough wine,
Keep the happy hand clenched to the wine-jug,
Today when the jug is all the hand has got.

While depressed, Khayyam was still angry at religious as authority.

Oh Canon Jurists, we work better than you,
With all this drunkenness, we're more sober:
You drink men's blood; we, the vine's.
Be honest—which of us is the more bloodthirsty?

Nevertheless, while hating what Islam had become, Khayyam kept his faith in God, a humanist, universalist, benevolent God.

Thou hast said that Thou wilt torment me,
But I shall fear not such a warning.
For where Thou art, there can be no torment,
And where Thou art not, how can such a place exist?

Al-Ghazali's Legacy in the Modern World

Al-Ghazali's interpretation has been orthodox in Sunni Islam for almost a thousand years. He is often regarded by Sunni as second only to Muhammed himself. This makes life difficult for Muslims who defy tradition and become scientists. The only Muslim to have won the Nobel Prize in physics is the Pakistani Abdus Salam, who won for his contribution to the Weinberg-Salam theory of weak interactions.

The first picture is of Salam with Steven Weinberg at the 1979 Nobel ceremony. As one can see, Salam chose his clothing to reflect his pride in his cultural heritage.



The second picture is Salam's tombstone in Pakistan, where he was buried in 1996. It originally stated that he was the "first Muslim Nobel Laureate" in physics. The word "Muslim" has been effaced on the orders of the Pakistani government. They don't think Salam was Muslim enough.

