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Instructor Bjork

Cosmology and Controversey

An Astronomical and Cosmological Comparison of Islamic and European Culture

To the average American, Islamic and European cultures may seem distant and unrelated. In the middle ages in particular, one may jump to the conclusion that Islamic culture lacked science and innovation and came from a completely different religious background than the west. However, when comparing Islamic and European cosmologies, prominent similarities and an intertwined tangle of influence become apparent. This comparison is effectively illustrated through the examination of Islamic and European creation stories and the progression of astronomical thinking in these cultures.

The book of Genesis provides the most common creation stories of European culture. Chapter one describes the six days in which God created day and night, the oceans, land, the sky, plants, animals, and humans respectively. On the seventh day Genesis tells us "God blessed the seventh day and hallowed it, because on it God rested from all the work of creating he had done" (NIV Study Bible, Genesis, 1:1-31, 2:2). A key point described by Dennis Richard Danielson in the *Book of the Cosmos*, is that in the Christian creation story the universe was not created from a primordial concoction as suggested by other cultures, but instead "by a [single] transcendent creator" (3). This aspect of the Christian creation story is essential to keep in mind when examining the creation story of Islamic culture. Unlike the Christian tradition in which the creation story is centralized in the book of Genesis, the Muslim tale is scattered throughout the

Quran. Roger Allen and Shawkat Toorawa explain in their book, *Islam: A Short Guide to the Faith*, that the contents of the Quran are the revelations of God to his Prophet Muhammad and are therefore necessary to examine in order to explain the Islamic creation belief (22).

Figure 1: A depiction of Muhammad on Mt. Hira. http://www.wikipaintings.org/en/nicholasroerich/mohammed-on-mount-hira-1925

According to tradition, while mediating in a cave on Mount Hira outside of Mecca, the first of these revelations came to Muhammad through the archangel Gabriel in which he told Muhammad to "recite the name of the Lord that had created all men from a blood clot," as seen in figure 1 (Allen and Toorawa 29). The Quran emphasizes God's creation in a number of passages including these:

Have those who disbelieved not considered that the heavens and the earth were a joined entity, and We separated them and made from water every living thing? (The Quran 21:30)

Indeed, in the creation of the heavens and earth, and the alternation of the night and the day, and the [great] ships which sail through the sea with that which benefits people, and what Allah has sent down from the heavens of rain, giving life thereby to the earth after its lifelessness and dispersing therein every [kind of] moving creature, and [His] directing of the winds and the clouds controlled between the heaven and the earth are signs for a people who use reason (The Quran 2:164).

These revelations indicate that the Muslim tradition sees Allah as the creator of humanity, the heavens, the earth, and rules over all three—a belief not dissimilar from the Christian tradition.

Despite this visceral similarity, it is important to address the differences between both creation stories. Mohd Habibullah Bin Abdullah, a Muslim journalist, points out some key differences in his article about the creation stories in both traditions. Primarily, Abdullah mentions that where Genesis states the exact order in which God created the Earth, the Quran states in Sura' Yassin verse 33, "that God gave life to the earth that is dead, without mentioning on which day it had happened" (Abdullah). Abdullah also states that in the Quran verse 4:54 it is said that God created the Earth in six days, but nowhere does it mention that God took a rest on the seventh day (Abdullah). Another comparison made is that alike to the Old Testament, Adam was sent to populate the Earth from God. However, according to Abdullah, in the Muslim tradition "Adam committed a misdeed, repented and was forgiven for it. Man is not "fallen" from the Quranic perspective (in contrast to Christianity) and hence there is no need to "save" or ransom him" (Abdullah). Though all of the differences laid out by Abdullah are valid and accurate, when stepping back and looking at the two creation stories as a whole, these differences are nothing more than miniscule alterations in otherwise identical stories. In both stories, *the same* God created man, the earth, and heaven from nothing, sent Adam from the heavens to populate Earth, and is revered as being the one and only God. In this light, the technical subtleties described by Abdullah, despite their cultural ramifications, seem trivial on a larger scale, and make it easy to see that these stories are more similar than different.

In addition to the striking similarities between the two stories, it is intriguing to spot ways in which Christianity may have influenced the Muslim creation story. The Muslim creation story seems to mimic the Christian tale in how God created man, the earth, and the heavens. However, one could make the argument that the Muslim creation story's origins trace back to the Hebrew Scriptures. This raises the question, was the Muslim creation story influenced by Judaism or

Christianity? Unfortunately, there is no black and white answer. Instead, the truth is that in many ways Islam stems out of both traditions. Paul Brians, and instructor at Washington State University, explains that the Jewish and Christian creation stories are identical and that much of Christianity comes from Hebrew Scriptures (Brians). Judaism gave birth to Christianity and its creation story, and together Judaism and Christianity influenced the Islamic tradition.

Though it can be argued that the Muslim creation story may have stemmed out of Western culture, Islamic cosmology became a powerful influence in the progression of astronomical thinking and development in the west. Islam itself played a key role in the progression of Islamic astronomical development in the middle ages. In his book entitled *Science in Medieval Islam,* Howard Turner tells readers that Muslims devoted an entire field of astronomy entitled ‘ilm al-miqat to mathematical determination of the time in effort to more accurately fix the five times of daily prayer (63). In addition, John North in his text, *Cosmos*, tells us that calculating the times of prayer and determining the direction of Mecca both became “an end of itself feeding off the cleverness of Muslim astronomers” (190). With the Muslim faith as their fuel, it was not long until the Muslim astronomers of the time began to introduce pivotal instrumental improvements, and groundbreaking theories.

Figure 2: The Islamic astrolabe.
http://www.fotopedia.com/items/flickr-189670488

One of the most crucial Muslim improvements during the Middle Ages was the astrolabe. As described by Howard Turner, “the astrolabe was significantly enhanced—one might say perfected—by Muslims…as a sophisticated way to keep track of time and

direction" (Turner 66). In Figure 2, one can see the many different circles within an astrolabe, and the intricacies of its design.

In addition to the pivotal improvements to the astrolabe, a number of Muslim astronomical thinkers emerged during this time, the most prominent being Ibn al-Zarqellu. Zarqellu's access and recess model was largely respected for explaining the oscillatory movement of the eighth sphere—the spherical body believed to be home to all the fixed stars of the constellations in the geocentric model. Zarquellu's model also offered a precise procedure for determining the fluctuation of equinoxes, which depended on the positioning of fixed stars (North 219). More focal than the access recess model, however, was his development of the Toledan tables. These tables were some of the first documents to fully map out the movement of the fixed stars, the sun, the planets, and Earth and were also the most widespread means of predicting astronomical movement until improved European tables were invented in the thirteenth century.

The way in which Islamic cosmological ideas served as a backbone for European astronomers is central to examining Western astronomical progress. The development of the Alfonsine tables, and the vast improvements to the astrolabe help depict this relationship. The Alfonsine tables were notably the most widespread astronomical tables used after 1252, to predict the movement of the stars and constellations (North 227). However, John North argues that the creation of these pivotal tables was dependent on the earlier Toledan tables—the astronomical index created by Zarqellu (North 228). In addition, the Muslim's refurbishment of the astrolabe became a vital tool for European cosmologists and traders. Eventually the astrolabe was developed into an astronomical clock and the invention of the telescope superseded its use. However, the astrolabe was essential for the development of these new tools, and is regarded as

one of the most useful inventions of the Middle Ages (North 225). In cases of both tools, we see the peculiar way in which Muslim astronomical development greatly impacted European cosmological progress.

The role of religion in both cultures offers a comparison of a different nature. In the Renaissance, the Catholic Church played an extensive role in slowing certain cosmological ideas. Galileo was known for expanding the development of the telescope, and his use of it to solidify the heliocentric model—a model describing how the sun is the center of the universe and the planets revolve around it (Hamilton 166).

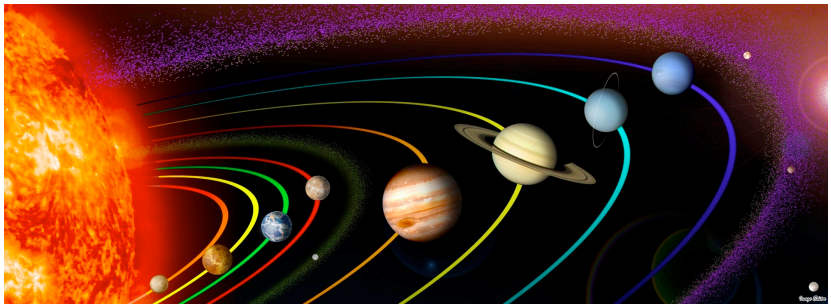

Figure 3: The heliocentric model was denounced by the Catholic Church as it implies that the Earth and planets orbit the sun, suggesting the Earth was not the center of the universe. http://www.fotopedia.com/items/flickr-2818891443

Though throughout the Middle Ages, the Catholic Church was somewhat supportive of cosmological ideas, the proposition of a heliocentric model as described in figure three was something they could not condone (Hamilton 167). The Catholic Church denounced that Galileo's findings went directly against the scriptures and threatened to torture and imprison Galileo until he recanted (Hamilton 166). In fear of the church's threats, Galileo revoked his findings, and went into house arrest.

A similar example of the way the Catholic Church interfered with astronomical thinking is seen through the habits of Copernicus. Though he pioneered theories on the heliocentric model, he concealed them from the public until he was on his deathbed in fear of repercussions from the Catholic Church (Hamilton 167). In the cases of Galileo and Copernicus, we see that the Catholic Church played an intensive role in preventing the spread of astronomical thinking—a contrast to that of Islamic cosmology in which Islam played a crucial part in the production of

astronomical tools and ideas such as the astrolabe. Though the cases of Galileo and Copernicus took place in the Renaissance and the bulk of Muslim astronomical developments occurred in the middle ages, it remains true that religion severely impacted the way in which astronomical ideas were developed in both cultures.

Both the way in which European cosmology gained much of its influence from the ideas and creations of Muslim astronomers, and the impact of religion in both cultures' astronomical progress, shows a concrete way in which these two cultures share extensive commonalities. Moreover, when examining the creation stories in both cultures, it is interesting to see how the Islamic creation story was greatly influenced by the Christian tradition. Conversely, in astronomical development the European thinkers were heavily influenced by the inventions and ideas of Muslim scholars. But this comparison offers much more than an intriguing cartwheel of influence and striking similarities between Islamic and European culture. Rather, it offers a unique way to perceive two superficially distant cultures as more alike than once thought through the lens of cosmology and astronomy.

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Figures

Figure 1: Muhammad on Mount Hira. http://www.wikipaintings.org/en/nicholas-roerich/mohammed-on-mount-hira-1925

Figure 2: Astrolabe. http://www.fotopedia.com/items/flickr-189670488

Figure 3: The Solar System. http://www.fotopedia.com/items/flickr-2818891443