

Re-writing the History of Science in the Islamic Civilization: Report of George Saliba's visit to Lahore, November 2007

Khwarizmic Science Society

<http://www.khwarzimid.org>

Prof. George Saliba is a Professor of Arabic and Islamic Science at Columbia University, New York. He is one of the leading historians of science and is credited with the presentation of a logically consistent and historically coherent appraisal of the origins, flowering and eventual decline of the scientific tradition in the Islamic civilization. His most recent publication on this thesis is the book "Islamic Science and the Making of the European Renaissance" published by the MIT Press earlier this year (2007). Dr. Saliba's viewpoint challenges the classical perspective described in most textbooks and popular accounts of the history of science. It will be useful to first recount how the "classical narrative" reads.

The classical narrative reflects apathy to the cultural, ideological and religious context of the Islamic civilization that historically accommodated a formidable scientific enterprise. The narrative aims at creating a phantasmagoria that even though scientists that were a part of the Islamic civilization transcended in major fields of scientific inquiry, their role remained, at best, one of an intelligent postman. They took the classic Greek sources and engaged in a massive translation and commentary movement, mostly under the patronage of the Abbasid Caliph Mamun-ur Rashid in his *bait-ul-hikmah* (House of Wisdom). As a result, Muslims inherited Greek logic and Greek sciences and employed these newly learnt skills in producing an impressive repertoire of scientific knowledge, but only *adding* to and *complementing* Greek sciences. After this re-enactment and re-packaging, the end product was bequeathed to the West at the time of the so-called first Renaissance, around the 12th century. Muslim science then became irrelevant. It is this classical narrative Dr. Saliba critiques.

In early November, the Khwarizmic Science Society (KSS), Pakistan's most active popular-science organization, invited Dr. Saliba for a visit to Pakistan, thanks to a generous sponsorship by Engro Chemical Pakistan. Planning for Dr. Saliba's visit started as early as 2006 from the initial communication to the conclusion of his visit in Lahore on November 5, a substantive organizational and intellectual exercise was in place. Headed by the President of the Society, Dr. Saadat Anwar Siddiqi, Professor of Solid State Physics at the Punjab University and Dr. Sabieh Anwar, Joint Secretary of the KSS, a team of dedicated students and teachers took up the task of organizing a public symposium and laying out the schedule of Prof. Saliba's visit. This tested the meager resources of the KSS, but thanks and praise to Allah, the Society could be proud of its achievement.

When the KSS announced Dr. Saliba's coming to Pakistan and the organization of the public symposium, it started receiving discouraging responses from critics inside the country. It was soon realized how emotionally charged individuals can become when it

comes to a joint mentioning of religion, in our case, “Islam”, with “science”—especially embodied in Dr. Saliba’s usage of terms like “Islamic science”. The names and titles of the presentations by our worthy speakers were announced and individuals came up with responses like:

Some of the Muslims may derive motivation to seek knowledge by listening to the accounts of their ancestors' works. But then that's only a political gimmick, nothing more than a bait.

And also,

The good thing about such is that you can get plenty of speakers who will be experts in this philosophical debate, but no real men or women of science.

And many more like these.

All of this criticism completely ignored the Society’s motivation in organizing this whole affair. The motivation was to unravel certain aspects of the debate in the history of science, paying special attention to the unique cultural, social, political and economic contexts of science in the Islamic civilization – a civilization that at least we claim to be a part of. There is little doubt that these debates are of extremely relevant interest to the modern practitioners and historians of science, especially when we live as knowledge-starved nations. A historical account of the relationship between religion, culture and science will help us understand our scientifically impoverished present and whether we would like to continue living as a scientifically dependent civilization in the years to come.

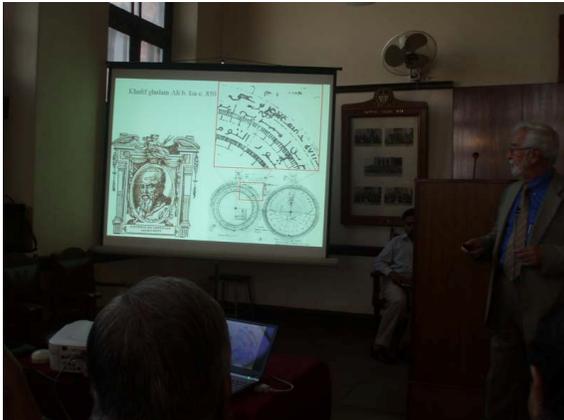
Furthermore, many of these debates have always remained confined to specialist circles. In keeping with the objectives and the major strengths of the Khwarizmic Science Society, there was the growing need to teleport these ideas and discussions to the level of the public and to students, be they students of science, history, philosophy, religion, social sciences or the languages and literary arts. It is this role the KSS has effectively played.

Lecture on ‘Problems in the Historiography of Science’ at the Government College University, Lahore

The Government College University (GCU) Debating Society, in partnership with the KSS, organized a lecture on the ‘Problems in the Historiography of Science’ on the morning of November the 3rd. The GCU is one of Pakistan’s most prestigious universities, established in 1874 and has produced the likes of Allama Iqbal and Abdus Salam.

In his lecture, Dr. Saliba presented certain ‘myths’ about Islamic science and showed, one by one, how these myths could not stand the test of logical cohesion, preserved documentation or historical evidences.

One myth dealt with the beginnings of science in the Islamic world. The myth is that a massive translation movement of rendering the classic Greek texts *started* in the times of the Mu'tazilite Abbasid Caliph, Mamun-ur Rashid, who reached the helm of power in 813. In a short while, all major Greek texts, such as Ptolemy's '*Almagest*', Euclid's '*Elements*' and Diophantus's '*Arithmetica*' were converted into Arabic. According to the myth, this translation movement marked the beginning and apex of science in the Islamic civilization.



Dr. Saliba showing the astrolabe drawn by Sangallo.



Dr. Saliba answering questions from the GCU Faculty.



View of the audience.



Another view of the audience.

However, Dr. Saliba showed that this period was neither the beginning, nor the apex of the scientific heydays. He presented a large corpus of documented evidence to this effect. For example, Al-Hajjaj bin Matar's translation of the *Almagest*, produced around 829, and that is still preserved in the library of Leiden University, reveals a phenomenal mastery of the Arabic language. Remember that here we are talking about a highly sophisticated mathematical treatise, replete with mature Arabic terminology. Who taught al-Hajjaj the necessary mathematics and the necessary technical Arabic? Who taught him the purely scientific skills to not only translate the *Almagest*, but to also correct its several errors? It must be the case that al-Hajjaj was one individual in the several generations of scientists and mathematicians who were participating in an iterative process of translations and refinements to translations, in parallel with a gradually maturing

expertise in geometry, trigonometry, arithmetic, astronomical experimentation and the Arabic language itself.

Dr. Saliba also showed that when the Abbasid Caliph Al-Mansur was laying the foundation stone of Baghdad in 762, a group of astrologers, Masha'-Allah, al-Fazari and Nawbakht, cast a horoscope advising the Caliph of a propitious day, July the 23rd. Casting a horoscope is by no means trivial. Who taught these scientists this sophisticated mathematical exercise? Is it possible to consider that these astronomers were inexperienced novices, working in synchronous isolation, not backed up by an earlier well-established tradition in mathematical astronomy?

In fact, Dr. Saliba recounted a story in a somewhat ignored text, the '*Al-Fihrist*' by al-Nadim. He described that this story helps us reach a more acceptable chronology for what comprised the first major impetus for the mathematical and scientific spirit in the Islamic civilization. It also helps answer some of the questions we outlined above.

Al-Nadim's story establishes that there was an emerging *need* for translating and Arabicizing the 'Diwan' during the reign of the Umayyad Caliph, Abdul-Malik bin Marwan (reigned 685-705). The Diwan was a collection of texts, containing official handbooks and elementary scientific texts describing methods for computing and documenting revenues of the government (*diwan li-wujuh-al-amwal*). However, this component of the Diwan was either in Persian or Greek and as the Islamic empire expanded to engulf larger and larger areas, encompassing Persian and Syriac speaking populations, Abdul-Malik felt the need for greater administrative uniformity. He ordered a translation of the Diwan into Arabic.

In fact, the expanding Islamic empire had imposed new demands in science and mathematics. Land had to be surveyed; irregular-shaped estates had to be measured; the Islamic laws of inheritance had to be established; revenue collection from, for example, the rapidly advancing armies, the obligatory *zakat* from the Muslim and the *jizya* from the non-Muslim subjects had to be computed; water distribution systems had to be laid down; and bridges and arches had to be built. All of these cultural, political and religious needs helped devise new tools in arithmetic, geometry, trigonometry and detailed fractional computations – calculations that were far from being trivial in an age without computers.

The Diwan officer also had to be proficient in astronomy for conversion between the Hijri, Byzantine and Persian calendars, for purposes of agriculture and tax collection and for moon sighting. New gold coins had to be minted replacing the Byzantine and Sasanian coinage, all the more reasons for studying metallurgy and chemistry (then known as alchemy).

In short, all of these administrative, political, religious and cultural requirements became the main thrust behind the flowering of sciences. How did then the non-Arabic speaking communities respond to this campaign in Arabization? Dr. Saliba argued that they were impelled into acquiring a mastery of more advanced sciences in order to regain their

bureaucratic positions in the office of the Diwan. This severe competition resulted in many of them turning to the more developed Greek texts such as the *Almagest* and a major translation movement of the more advanced scientific texts ensued. In the short term, this enabled the translators' possession of key government posts, ensuring bureaucratic supremacy. In the longer run, this nurtured the scientific enterprise itself. As Dr. Saliba described, science by its very nature, cannot be restricted to a class or be monopolized by its very possessors. The scientific movement hurled the Arabs back into the competition, and the application of science to the growing needs of the burgeoning Islamic civilization created higher degrees of scientific specialization and the cyclic process continued.

The American scholar went on to challenge even some more myths permeating the classical narrative. One such presumption is the 'contact theory' which states that the Islamic civilization simply inherited Greek and Persian sources from the Byzantine and Sasanian empires, that were contemporaneous with the early Abbasid times. Dr. Saliba showed that this could not be true as we do not have historical records or extant copies of any accomplished texts that were produced in these empires, or were in wide circulation when Islam came in contact with these civilizations.

Another myth is the 'pocket transmission' of scientific knowledge whereby it is assumed that the scientific and translation activities were injected into Islamic civilization through selective islands of excellence. The most popular examples of these oases in the wilderness were Harran and Jundishapur! But this channel of transmission is also fraught with shortcomings. How could, for example, isolated cities preserve Greek texts for more than five hundred years, with the precognition that the Islamic empire would acquire these texts in its strange unprovoked awakening in the beginning of the 9th century? Why could these isolated cities not influence neighbouring cities in the same empires? Why do we not find records of any scientific or philosophical luminaries coming from these cities and even if they existed, why are all their works lost to oblivion?

Several other important points were also raised by the guest speaker. Many of these points were also elaborated at greater lengths in the symposium the following day. We will summarize these points later in this report.

Here, the KSS also feels the important responsibility of highlighting some inaccurate press reporting of this lecture as it has appeared in the Daily Times and Dawn (November 6th, editions).

These press reports grossly misquote Dr. Saliba when they mention that 'Muslim scientists have made all discoveries of the modern age'. This claim was, simply, never made and represents a complete failure in understanding the guest speaker's central thesis. According to Dr. Saliba, modern science is a magnificent edifice made up of several building blocks. One of these many building blocks is Islamic science. As Dr. Saliba exemplified using images of actual Arabic and Latin texts, Islamic science has played an important role in shaping several important ideas contributing to the scientific environment at the times of the European Renaissance. Dr Saliba's investigations do not belittle the miracle of the European renaissance but rather gives the Islamic civilization

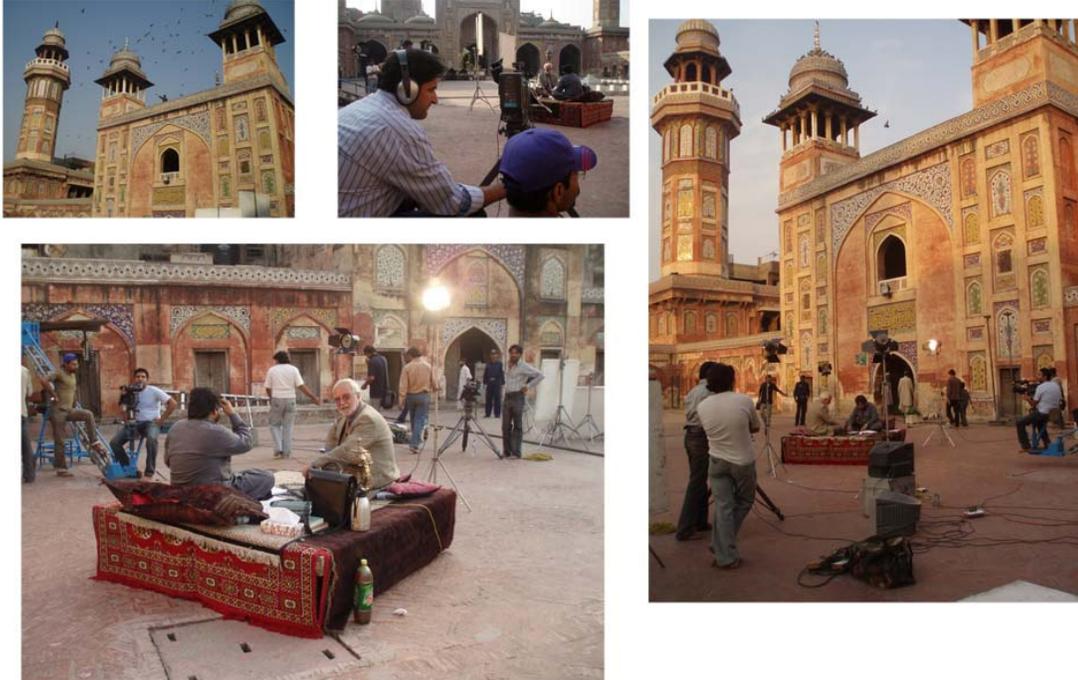
its proper due in the making of that miracle. Nevertheless, the claim that all modern inventions are made by Muslim scientists is only a historical fallacy, Dr. Saliba obviously never supported.

However, in his lecture, Dr. Saliba did mention several examples of inventions made by scientists working in the Islamic civilization. For example, Al-Khwarizmi's algebra was an altogether new invention, since the very word algebra did not exist in Greek. Ptolemy's cosmological model of a sphere's rotation, in place, around an axis that did not pass through the geometrical centre was challenged as being physically unrealizable. New methods of astronomical observation were devised and astronomical quantities such as the angle of inclination between the ecliptic and the equator, as reflected in the inclination of the earth's axis of rotation were measured with greater accuracy, yielding a value of $23 \frac{1}{2}^{\circ}$, extremely close to the value we use today. Ibn al-Nafis predicted the circulation of the blood through the lungs for it to be mixed with rarified air as he said, in complete opposition to the view held by Galen and all physicians and anatomists who asserted that the blood flowed directly from the right ventricle of the heart to the left.

Dr. Saliba also mentioned the fact that the Islamic civilization took up the Indian numerals and made their use more widespread. Muslim mathematicians also introduced the concept of the decimal point, opening up new vistas in calculating with fractions. As an example, Dr. Saliba depicted a folio from Uqlidisi's manuscript completed in Damascus in 952 showing the use of decimal fractions. These Indian-Arabic numerals were already a part of the decimal number system and were mentioned by Dr Saliba, but contrary to the erroneous press reports cited above, Dr. Saliba did not make the claim that the binary number system on which modern computers are based was developed by these mathematicians.

Interview at the Wazir Khan Mosque

In the afternoon, Dr. Saliba visited the famous Wazir Khan Mosque in the heart of the Kashmiri Bazaar, itself the heart of inner Lahore. The route between the Delhi Gate and the entrance of the mosque was an apt reminder of Forster's 'Passage to India' where he describes that in India things seem to be moving in a direct course of collision until they come closer and dissipate. Lahore's Kashmiri bazaar was no different. The mosque itself, often called the 'mole on the cheek of Lahore' was built in 1642 by the Wazir Khan, Governor of Lahore to the Moghul emperor Shah Jehan. The purple and burgundy tile work on the façade and the minarets, inlaid with meticulous craving for artistic and calligraphic perfection, presented a splendid contrast against the backdrop of the splendid blue sky, suffused with the yellow of the sun.



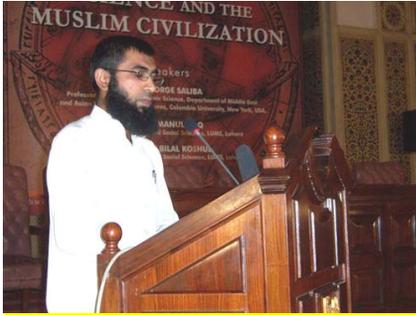
Shots from the interview at the Wazir Khan Mosque.

Video cameras, sound and light technicians and a busy direction team were assembled in the courtyard for a longish interview recording of the visiting scholar. Shahrukh Hameed from the Iqbal Academy Pakistan was the host and he kept Dr. Saliba engaged for a solid four hours. They sat on a ‘throne’ surrounded by an urn delivering Green tea, a pile of books and some bottles of mineral water hidden from the watchful eyes of the camera. The details of the interview will be left for the interview itself when it has been edited and approved.

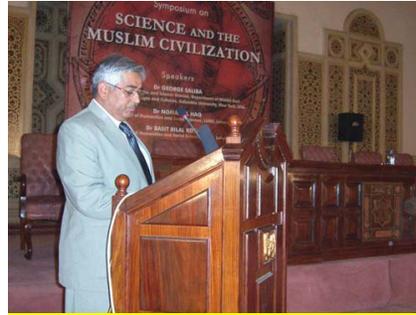
Symposium on ‘Science and the Muslim Civilization’

The Khwarzimidic Science Society organized the symposium on Sunday, 4 November with the partnership of the Iqbal Academy Pakistan. This event was a very successful example of resource sharing, whereby a relatively smaller non-profit science association with strong roots in the local academia and students, collaborated with a government owned scholarly research organization having access to infrastructure, contacts with the media and an active publication facility. The KSS thanks the Academy and especially the Director Suheyl Umer for this very fruitful collaboration.

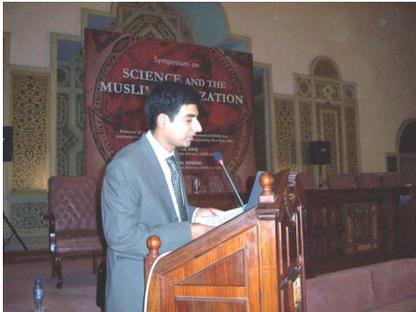
The splendid auditorium, the large number of audience (approaching about 400), the elegant backdrop and the impeccable organization by the KSS volunteers, led by Shahab Ahmed Joint Secretary KSS and Rafiullah Executive Member KSS, all bespoke of a very high caliber event. The audience came from different disciplines, ages and institutional affiliations, the biggest groups coming from the Solid State Physics and Philosophy Departments and the Sheikh Zayed Islamic Centre of the Punjab University.



Hafiz Hashmi reciting from the Holy Quran.



Dr. Saadat Anwar Siddiqi presenting the welcome note.



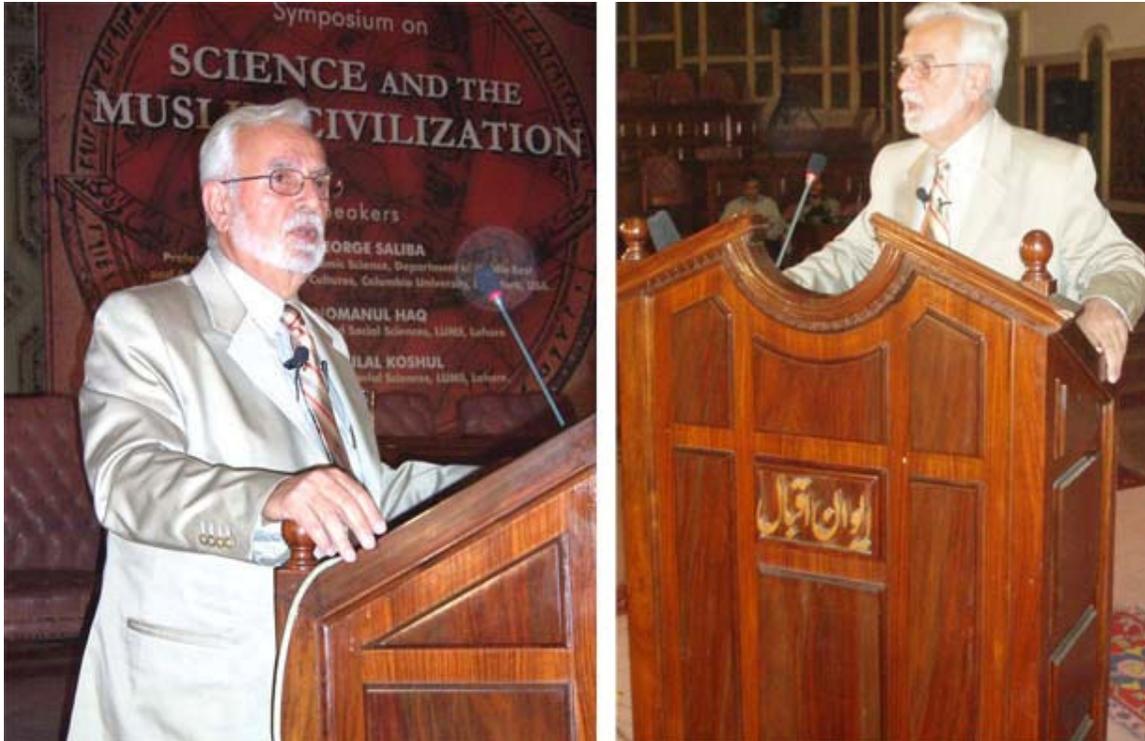
Dr. Sabieh Anwar moderated the proceedings.



Saliba exchanging ideas with eminent physicists.

Hafiz Ahmad Hashmi started the proceedings with a heart-touching rendition from the Chapter of Luqman from the Holy Quran. The opening address was made by the President of the KSS, Dr. Saadat Anwar Siddiqi, outlining the Society's motivation and introducing the theme of the lectures to follow. The sessions were moderated by the Joint secretary of the KSS, Dr. Sabieh Anwar.

Dr. George Saliba's lectures were split into two parts. The first was 'Islam and the transformation of Greek science' and the second was 'Islamic science and the making of the European Renaissance'. Both of these lectures were brought to life by stunning viewgraphs depicting original manuscripts in the Arabic and Latin. It was clear that the material was a fruit of decades of the Professor's labour of love, his never-ceasing journeys to the libraries in Europe and Asia and his digging out of resplendent pearls from the stockpiles of manuscripts. His presentations also manifested a complete mastery of the Arabic, Greek and Latin texts of these highly mathematical treatises. An important point we would like to emphasize is that all of this material was presented in a refreshing and welcoming manner, fulfilling the Society's very purpose of inspiring young minds who might not be specialists in the history of science.



Dr. Saliba lecturing at the Symposium on Science and Muslim Civilization.

In the first lecture, Dr. Saliba discussed the role the Islamic religion and culture played in the importation, naturalization and advancement of sciences imported from Greek sources. The thesis was that the interaction of the Islamic civilization with the Greek intellectual movement went beyond a mere adoption and translation of Greek texts and was rather a process of transformation and metamorphosis. Once again, Dr. Saliba rejected the ‘refrigerator hypothesis’ that attempts at claiming that the role of scientists in the Islamic domain was simply to preserve the Greek body of knowledge and passing it on to the Europeans at the time of the Middle Ages or the European Renaissance.

Most of the time in the first lecture was devoted to showing that the unique cultural and juridical requirements of the Islamic ‘Fiqh’ provided the impetus to scientific and mathematical expertise in many domains. Dr. Saliba took up several examples from the template of astronomy to prove this point.

The Quranic statement that ‘verily the *salat* is to be performed by believers at prescribed times’ naturally translated into the highly scientific problem of precisely determining prayer times around the clock and through the year. Fasting also required a careful computation of the times for dawn and dusk. These ritualistic requirements gave birth to a highly sophisticated astronomical discipline called *ilm-al-miqat* (the knowledge dealing with the times [of prayers] among others). The religious aversion to the use of astrology for purposes of precognition also helped liberate the science of astronomy from its purely predictive role and transformed it into to a more theoretical and mathematical discipline, that was even given a new name, *ilm-al-hay’a* (the science of configuration [of celestial bodies]), a term that had no Greek equivalent.



Sections from the audience.

Similarly, the requirement to face Makkah during prayer also opened up the famous ‘Qibla’ problem. Finding the direction of the qibla on the surface of the earth was a highly mathematical problem in spherical trigonometry – a problem that had not been addressed before the advent of Islam. The sine and cosine functions, unknown to the Greeks were used in the Indian tradition, and the geometers and astronomers in the Islamic lands began using these functions with increasing facility, and also introduced new functions such as the tangent and the cotangent. These functions gradually supplanted Ptolemy’s clever but tedious use of chord tables. Importantly, the sine and cosine laws were also invented in context of the qibla problem. How can one imagine doing trigonometry today without recourse to these basic functions, trigonometric laws and identities?

The religious motivation also enabled the astronomers in the Islamic domains to revisit Ptolemy with a freshly critical approach. Anything coming from Greek sources was considered foreign and belonging to the *ulum-al-awail* (ancient sciences) and was subject to the closest scrutiny. In fact, the critical approach became a prerequisite for social and intellectual acceptability, especially within religious circles. As a result, there were three kinds of revisions or transformations to Greek astronomy, especially Ptolemaic astronomy, carried out by a long line of illustrious astronomers from the ninth to the sixteenth centuries.

First, there was the correction of observational and parametric errors. Dr. Saliba explained that very early on in the history of Islamic astronomy, several astronomical parameters were corrected and refined. For example, the value of the inclination of the ecliptic with the earth's rotational axis was determined to be $23 \frac{1}{2}^{\circ}$, exceptionally close to the modern accepted value. The rates of stellar precession, the motion of the solar apogee (supposed to be fixed in the Greek sources), and the length of the lunar month were all remarkably refined. New accurate methods of astronomical observation were set in place such as the *fusul* method aimed at determining the solar apogee by observing solar declination at the mid-points of seasons rather than at the start of the seasons (equinoxes) and solstices as was done in the Greek sources. New astronomical instruments were also constructed all aimed at refining the observations.

Second, there were problems with Ptolemy's mathematical constructions of the motions of heavenly bodies. For example, his lunar model predicted that the quarter moon appears twice as big as the full moon. This was clearly absurd and as the Damascene time keeper and astronomer Ibn al-Shatir (died: 1375) boldly remarked, "it was never seen as such". Ibn al-Shatir therefore presented an alternative model which removed this error. Then there was the famous equant problem. The gist of this problem was that Ptolemy's astronomy used rotations of spheres around a hypothetical point (called the equant) that did not coincide with the geometrical centre. With a simple animation, Dr. Saliba showed that such a model was physically impossible. He then went on to describe that the equant problem was not only identified by the Muslim astronomers, but also solved. The alternative models of the sun, the upper planets and mercury, proposed by astronomers of the calibers of Ibn al-Shatir, Nasir-ud-Din Tusi (d: 1274), Mo'ayyad-Din Urdi (d: 1266), Qutb-al-Din Shirazi (d: 1311), Shams-ud-Din Khafri (d: 1550) used new mathematical theorems, unknown to Ptolemy or the Greeks. In this respect, Urdi's lemma and the Tusi's couple stand out as the brightest achievements in the field of mathematical astronomy. These results were invariably used by most astronomers after Tusi, including Copernicus (d: 1543).

The third kind of objections raised against Ptolemy was of a more fundamental nature. For example, the nature of the ether was subject to criticism. The role of mathematics was appreciated as a language used to describe physics. The internal consistency of science, including the compatibility between mathematical models and physical possibility was thoroughly researched. The importance of experimental observation was highlighted and the ingredients of the scientific method were beginning to be established.

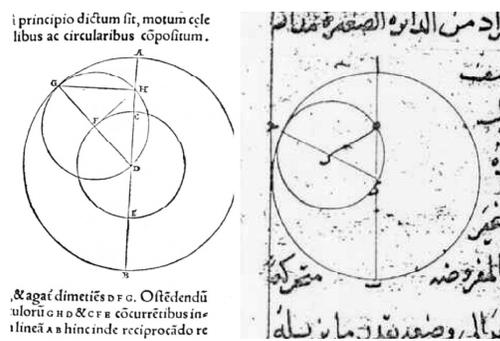
Dr. Saliba demonstrated through examples that this spirit of innovation and liberation from Greek sources was not only confined to the field of astronomy. He described that implementing Islam's laws of inheritance requires complicated computations and these computations necessitated the development of new arithmetic tools and eventually the new discipline of algebra by Al-Khwarizmi. As a result a new discipline, *ilm-al-faraid* (the science of inheritance) came into being, once again thanks to Islam's unique juridical requirements. The concept of the decimal fraction was introduced, toppling the cumbersome use of Greek numerals. Dr. Saliba also showed several Latin manuscripts produced in the Middle ages that in fact wrote numerals from right to left (in keeping

with the Arabic tradition) while the remainder of the text was in the usual direction from left to right. Ibn-al-Haitham (d: 1039) overthrew the old Greek model explaining how the eye sees and conjectured a model of vision that we still use today. Abu Bakr al-Razi (Latin Rhazes d: 925) had the intellectual courage of challenging the Greek master Galen and describing the clinical differences between smallpox and measles. These examples served to demonstrate that science in the Islamic world was far from being a preservation exercise, rather we glean that the incoming Greek sciences were approached with utmost criticism, were comprehensively attacked and most of the sciences, especially astronomy, were established on new footings.

In the second lecture, Dr. Saliba described the intellectual and cultural environment inside Europe around the sixteenth century and onwards, the culture that gave birth to the Renaissance. The special focus was on the works of Copernicus, whose heliocentric viewpoint is considered to be a milepost in the intellectual history of mankind. Dr. Saliba conceded that achievement to Copernicus but demonstrated how the mathematical theorems and planetary models that were developed in the Islamic world were incorporated by Copernicus into his mathematical astronomy. He thoroughly discussed the organic relationship between sciences produced in the Islamic dominion and the Renaissance sciences and argued that at the time of the Renaissance, Europe had no reason to completely depend on Greek scientific literature that had by then become obsolete and had been superseded by the more advanced scientific literature that had been produced by Muslim scientists.

Dr. Saliba described Neugebauer’s work from the 1950’s revealing how the lunar model used by Copernicus was exactly similar to the model developed by Ibn al-Shatir about two centuries earlier.

The second example taken up by Dr. Saliba was Copernicus’s proof of the theorem called the Tusi couple. Copernicus’s proof is once again, completely identical to the proof furnished by Nasir-ud-Din Tusi in 1260. Even the alphabetic designators of geometric points used in the Arabic and Latin renderings are congruent, an “A” for “alif,” “B” for “ba,” “G” for “jim” and “H” for “ha”.

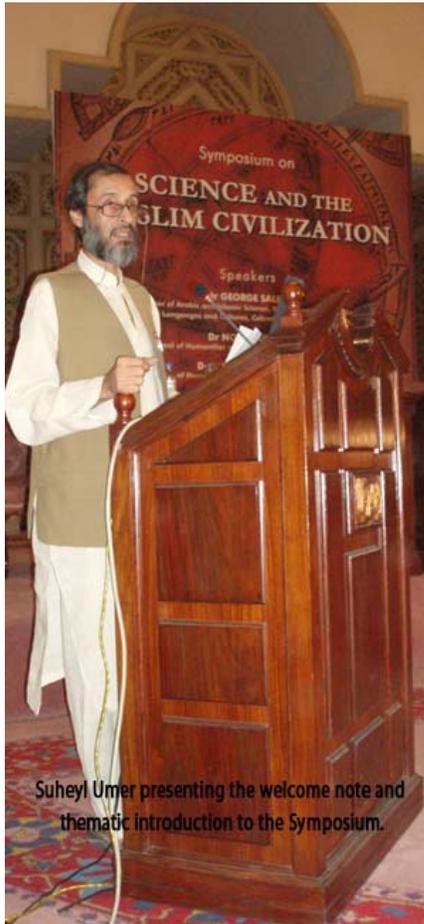


In the third example illustrated by Dr. Saliba, Copernicus’s model for the planet Mercury was identical to a model developed by Ibn al-Shatir, but the details show that Copernicus did not fully understand the model he was copying.

Despite all these similarities, as Dr. Saliba rushed to point out, there was no evidence that Copernicus knew Arabic. How could he then read Ibn al-Shatir’s or Tusi’s texts even if we assume that he did have access to their manuscripts? It was also known that neither the works of Urdu, or Tusi or Ibn al-Shatir had been translated into Latin nor Greek at the

time Copernicus was employing his ingenuity at modeling the solar system. How did the cultural contacts between Islam and Europe then take place?

The scholar went on to provide convincing clues of possible routes of this cultural transmission. He mentioned an Arabic manuscript of Tusi's '*Tadhkira*' compiled in 1260 that is still kept in the Vatican library. The manuscript contains a proof of the Tusi's couple used by Copernicus. The possessor of this manuscript is identified as Guillaume Postel (1510-1581). The astounding feature of the manuscript is that it has annotations in Latin indicating that Postel not only understood the Arabic but was also mathematically competent to supply his own remarks. The conjecture is that Postel, a contemporary of Copernicus, or someone like him could have updated the latter about the Arabic text and its contents. Dr. Saliba described that Postel's own stature, such as his being part of a



Suheyl Umer presenting the welcome note and thematic introduction to the Symposium.

delegation sent by the French King Francois I to the Ottoman emperor Suleiman the Magnificent and his frequent tours to the Islamic world, all indicate his skills of the Arabic language. And he was not alone among Copernicus's contemporaries and predecessors.

Dr. Saliba also established that these strong ties also existed in the field of scientific instrumentation. He exemplified this with the famous Italian and Renaissance architect Sangallo who was commissioned to design nothing less than the famous St. Peter's cathedral in Rome. Sangallo copied an astrolabe produced in Baghdad in around 850, reproducing the same front, back and rete and even the name of the maker, Khafif student (*ghulam*) of Ali bin Isa. An accomplished architect reproducing an instrument constructed in Baghdad more than 700 years earlier demonstrate the prestige and the reputation for accuracy, Muslim scientific instrumentation enjoyed in Europe at the time of the Renaissance.

The historiography so masterfully articulated by Dr. Saliba naturally led to many philosophical digressions such as the role of religion in fostering or hampering science, the paradigm of the conflict between science and the church in the Christian Europe and the nature of science itself. In an interim summary presented in Urdu by the Director of the Iqbal Academy, Suheyl Umer, these very points were carefully touched upon. Using simple analogies, Umer introduced the trends of philosophical modernism and post-modernism and highlighted their relationship with the science and religion debate.

The second invited speaker was Prof. Dr. Noman-ul Haq, Professor at the School of Social Sciences and Humanities at LUMS. Dr. Haq's paper was titled "Double incoherence and double jeopardy: the story of attitudes to sciences in Muslim societies". Dr. Haq discussed three myths that were prevalent in historiographical literature. First, modern science is a linear progression of Greek thought. Second, the religious orthodoxy stultified the progress of science in the days of Muslim glory. Third, scientists working in the Muslim societies were not a part of the mainstream; they lived on the marginal fringes. He took these myths one by one and showed that they were only myths, far removed from the historical, intellectual and social evidence.



Dr. Noman-ul-Haq (left) and Dr. Basit Bilal Koshul delivering their lectures.

In the very healthy discussion that ensued after Dr. Haq's presentation, several interesting points were raised by the audience and skillfully handled by the speaker. Especially the role of Imam al-Ghazali in the question of the religious orthodoxy and scientific attitudes was repeatedly mentioned. Dr. Haq showed that it is wrong to squarely blame al-Ghazali for the decline in the scientific spirit. Far from being a conservative in matters of scientific inquiry, his writings encouraged an undertaking of scientific knowledge, especially medicine and mathematics. Dr. Haq also described the difference between science and scientism and presented a critique of scientism, the conception that science is the elixir of life that can address and solve most of the problems humanity faces today. He also described his views on the difference between science and technology and lamented that in the Pakistani society of today, we have more technicians than scientists and it is all the more important to produce a society that is hospitable to a culture of science rather than a society that merely imports technological gadgetry from the west.



The Chief Guest, Dr. Khalid Hameed Sheikh giving away mementos to Dr. Saadat Anwar Siddiqi (left) and Engr. Shahab Ahmed.

The last speaker of the evening was Dr. Basit Bilal Koshul, also from the School of Social Sciences and Humanities at LUMS. Dr. Koshul's talk was titled "With friends like these who needs enemies: supporting science by attacking religion?" Dr. Koshul attacked the writings of leading scientists such as Richard Dawkins, Christopher Hitchens and Daniel Dennett for what he perceived to be their ignorant remarks about religion. The argument championed by these scientists is that science equals rationality and religion equals irrationality. In this context, Dr. Koshul quoted from the twentieth century social scientist Max Weber who demonstrated that science cannot grasp all of reality. It is limited in its scope and many modern scientists in fact, do a disservice to science itself by claiming that whatever science can grasp, is all there is in reality to begin with. In other words, as the speaker claimed, the view that science presents a complete picture of reality is false. Dr. Koshul also described that the same Cartesian and reductionist attitude prevails within the folds of science itself. For example, there is the constant thrust to reduce sociology to psychology; psychology to biology and biology to ultimately physics. This intellectual desire presupposes that such a reduction is indeed possible, a presupposition Dr. Koshul confidently rejected.

The second session of the symposium was chaired by Dr. Khalid Hameed Sheikh, former Vice Chancellor of the Punjab University, Advisor to the Babar Ali Foundation and a Life Member of the Khwarizmic Science Society. He applauded the efforts of the KSS, thanked the speakers, Engro Chemical Pakistan for financial support and invited the audience to join the Society.

Visit to Jamia Ashrafia

Jamia Ashrafia, established in 1947 is one of the country's premier centres of religious learning. Associated with a mosque, the Umm-ul-Qura University imparts religious education teaching, most notably, the *Dars-e-Nizami* curriculum and offering specializations in religious concentrations such as Quran, Hadith and Fiqh. Dr. Saliba's visit to the Jamia on the morning of the 5th of November, was made possible by the efforts of Mufti Kamal-ud-Din (LUMS) and Dr. Abubakr (McGill University and Life

Member KSS). The guest was warmly welcomed by Fazl-ur-Rehman Ashrafi who also gave a brief introduction to the history and functioning of the Jamia.

Dr. Saliba then summarized his work in eloquent Arabic, followed by a lively question and answer session. One particularly interesting remark made by the speaker was when he was asked about the main motivation behind Abd-ul-Malik bin Marwan's initiative of translating the Diwan and the overall impetus behind the ascension of sciences in the Islamic civilization. To this the guest speaker succinctly responded, "*iqamat-ul-adl bain al-ra'iyah*" (i.e., to establish justice and balance among the subjects of the Islamic empire). Dr. Saliba was also shown the texts in theoretical astronomy (*hay'a*) that were taught at the Jamia and all other madrasa institutions inside the country.



Dr. Saliba's visit to Jamia Ashrafia.

Visit to Lahore University of Management Sciences (LUMS)

The last item on Dr. Saliba's packed schedule was Dr. Saliba's visit to Lahore University of Management Sciences (LUMS) in the afternoon of the 5th of November. Dr. Noman-ul-Haq was the host. Dr. Saliba addressed a packed auditorium of students and Faculty Members and was engaged in an animated discussion with Dr. Noman-ul-Haq and the students.

This time, Dr. Saliba talked at length about the theory of decline. He remarked that decline was a relative term and the decline of sciences in the Muslim world must be understood in light of global socio-economic and political currents. Not only was science in Islam on relative decline, but also the Chinese and Indian scientific traditions were on the descent in comparison to the ascent of science in Europe. The exception was Europe. Dr. Saliba explained how the discovery of the New World, read America, in 1492 was to change the course and geographical concentration of the scientific enterprise, giving birth to what we call modern science. After the discovery of America, huge payloads of gold, silver and cheap slave labour were continually brought into the Europeans lands. This created immense wealth, sufficient to establish and maintain scientific capacity of the highest magnitude. The 'Age of Discovery' and the colonial onslaught on much of the rest of the world added to the economic strength necessary to support capital creation through science and scientific creation through capital. The Islamic world was totally by-

passed, trade routes shifted from the Indian to the Atlantic oceans and a colonial mindset soon permeated the Islamic Empire. It is not a mere coincidence that between 1500 and 1550, three new Muslim empires appeared on the world map – the Ottomans, the Safavids and the Moghuls. Dr. Saliba argued that is in this wider economic, social and political context that the decline of science in the Islamic world must be searched for.



Dr. Saliba addressing Dr. Noman-ul-Haq's class at LUMS.

Mufti Kamal-ud-Din then presented a heart touching tribute to Dr. Saliba admitting that his two encounters with George, one recently and the other more than a decade ago at the University of Chicago, had changed his outlook on life.

At this point, the KSS also thanks the efforts of its Life Member and cardiac surgeon Dr. Faisal Habib Cheema in New York for his splendid help in the coordination with Dr. Saliba.

Dr. Saliba's gracious mentorship, his humbleness, his deep respect for knowledge and his inspiration would leave an indelible mark on the minds and hearts of all of those who listened to him in his brief trip to Pakistan.