Lecture No. 30: Islam and Science - II

(Module 1(128): The role of Muslims in scientific development and Promotion)

The Role of Scientists:

The Holy Qur'an invites humanity to think and ponder in order to understand religious facts. The Muslims received encouragement from Islamic teachings to make enormous progress in the field of knowledge, while in Europe during that period; the inhabitants did not have access to even clean drinking water. Libraries in the Umayyad and Abbasid periods and Translation centers were built and scholars were encouraged. The academic abilities and efforts of Muslim scientists provided the basis for new subjects of science and provided new avenues.

In every era, Muslims continued to render their services in Medicine, Astronomy, Mathematics, Algebra, and almost in every subject. A brief mention of their services is presented below.

Astronomy: The services of Muslim scientists in this field are unforgettable. They revived the knowledge stuck in Greek Philosophy and built it on a truly scientific basis. The names of celestial bodies in Western languages are still in Arabic, which proves that they are the discoveries by Muslim astronomers. The great Western Historian Prof Philip K. Hitti Acknowledging the services of the Muslim astronomers writes: “The Arab astronomers have left immortal marks of their work upon the heavens, which everyone, who sees the stars on the celestial sphere and read the names of heavenly bodies, can understand easily. Not only most of the stars in European languages are of Arabic origin, like Aqrab (عقرب) (Aghrab, اغرب scorpion), al-Jidi (الجیدی) (al-Jaadi, الجادی child), al-Tair (،الطائر) (الطیرflying), Dinab دینب (Zanb, ذنب Tail) Pherqad (Furgad, calf), but also a number of technical terms, including Nadir (Nazir (نذیر), Zenith زینتھ Al-Smat (الصمت), testifies to the rich legacy of Islam to Europe."

- Andalusian (اندلس)Muslim scientist Ibn Rushd (ابن رشد), known in the West as Averroes, Identified sun spots.
- Calendar reforms were made by Umar Khayyam.
- Sun and moon rotation, solar eclipse, astronomy, and many extraordinary scientific information about planets were provided by eminent Muslim scientists like Al-Batani (البتانی) and Al-Biruni (البیرونی)
- The reason for the special interest of Muslims in the field of timekeeping was that this knowledge was directly related to matters of prayers and fasting.

- The era of Al-Batani877 (البتانی AD. 918 AD) and Al-Biruni (973) (البیرونی AD. 1050 AD) belong to the third and fourth centuries of Hijrah. In other words, their work was done eleven hundred years ago.

Mathematics, Algebra: The name of 'Al-Khwarizmi' in the field of mathematics, algebra, and geometry is considered the founder of these fields. The word algorism or algorithm is derived from his name al-Khwarizmi. His book "Al-Jabr wa Al-Muqabala (''الجبرا و المقابلہ)" in the twelfth century AD was translated into Latin from Arabic. This book continued to be taught in the universities of Europe as a textbook till the 16th century AD. In that book, Al-Khwarizmi gives more than eight hundred examples of 'Integration and 'Equation'.

- The field of Trigonometric Functions reached Europe through the works of Al-Batani and Tangents through the books of Abu al-Wafa'.
- The concept of Zero was known to Muslims 250 years before Europe could learn about it. And Muslims used it.
- In the field of Arithmetic, Algebra, Geometry, and Trigonometry, etc., the founding services of Abu Al-Wafa, Al-Kindi, Thabit bin al-Qura, Al-Farabi, Umar Khiyam, Naseer ud Deen Tusi, Ibn al-Bana, al-Marakashi, Ibn Hamza al-Maghribi, Abu al-Kamil al-Misri, and Ibrahim are well known.
- Al-Marakhasi wrote 70 books on different branches of Mathematics.

Along with the above-mentioned arguments and references Philip K Hitti confesses the services of the Muslims in these words:

"The Science of trigonometry, like algebra and analytical geometry, was largely founded by the Arabs."

Mechanics, Dynamics, and Physics: Among the Muslim scientists of the Middle Ages, the works of Ibn Seena, al-Kindi, Naseer ud Deen Tusi, and Mullah Sadra are of great importance. Later, Muhammad bin Zikriay al-Razi, al-Beyruni, and Abu al-Barakat al-Baghdadi improved upon their works.

- Al-Razi promoted cosmology.
- Al-Baghdadi's and Mullah Sadra's ideas and researches in the fields of Motion and Velocity are a matter of surprise even to modern scientists.
- Ibn al-Haytham provided fundamental information for physics as compared to the disciplines of Density, Atmosphere, Measurements, Weight, Space, Time, Velocities, Gravitation, and Capillary Attraction. His book 'Kitab ul Manazir' is of great significance in the field of optics.

Botany: Al-Denwari's (895AD) book, 'Kitab al-Nabaat', in 6 volumes is the first voluminous encyclopedia Botanica. This collection was written at a time when Greek books were not started to be translated in Arabic. A Western scientific historiographer writes: It is very much surprising

that in ancient times, we find only two works equaling to the work of al-Denwari. How was it possible that in the early period of academic life, Muslims had attained the status that of the intellectuals and researchers of Greece, rather, they surpassed them in this matter." According to Professor Arnold, traveling to Makkah and Madina by the Muslims gave rise to biological sciences.

- Al-Ghafiqi and al-Idrisi traveled from Spain to Africa collecting information about hundreds of plants and compiled books.
- Ibn al-Awwam compiled a book on characteristics of the 585 plans and introduced the field of Botany to new grounds.
- Abdullah bin Abdul Aziz al-Bikri recorded the characteristics of trees and plants of Spain in his book 'Kitab Aayaan al-Nabat wa al-Shajariyaat al-Andalusia'.
- Ibn al-Rumia, the Botanist of Seville toured Africa and Asia in addition to Spain and did his research from the Botanic point of view on the plants and weeds he came across.
- Ibn al-Baytaar, Sahreef Idrisi and Ibn Biklarish were famous Botanists of Spain.

Medical Sciences: the names of al-Razi, Abu al-Qasim al-Zuhrawi, Ibn Seena, Ibn Rushd, and al-Kindi come at the top in this field. Muslims had established big hospitals and medical colleges in the early age of Islam. Classes for Pharmacy and Surgery were held there. Around a thousand years before, the renowned medical practician al-Razi (930AD) composed 200 books on medical science. Some of these books were translated into Latin, English, and other languages. From 1498 to 1866 they were published 40 times. Al-Razi presented for the first time the correct diagnosis of smallpox and measles. Abu al-Husian ibn Seena (Avicenna)'s book 'al-Qanoon' is a masterpiece of medical science. This book too was translated into Latin and other languages from Arabic. This book had been the syllabus in most European universities till 1650 AD. Abu Rehan al-Bayruni (1048AD) compiled his work on pharmacology. Ali Ibn Isa al-Baghdadi's and Ammar al-Musali's books on ophthalmology were included in syllabi of medical colleges as a textbook in the universities of France and Europe during the first half of the eighteenth century. A non-Muslim Western thinker E.G. Browne writes: when the Christians of Europe used to bow down in front of their idols, Muslims were having licensed doctors, medical experts, and great hospitals. From the tenth century, medical science and pharmacy were made a regular discipline. There was a time when Sanaan bin Thabit was the president of the board of examiners in Baghdad. Arabs were the first who established medical stores. Hairdressing shops were examined from a medical and hygienic point of view. There is a mention of mobile hospitals in the eleventh century. These hospitals were open for everyone no matter he was a rich or poor, man or woman. There were separate male and female wards. Wards were specified for fever, eyes, surgery, dysentery, and intestinal ailments. In addition, kitchen, lecture hall, and dispensaries for medicines were too available there. In short, every branch of medical science was taken care of there.