

The Valuable Works Of Razi

Mankind is indebted to Razi for his valuable contribution and research. Europe especially has greatly benefitted from his works. Razi has a special, universal fame. One cannot find many scientists who have written as many useful books as Razi. Over 250 books have been authored by Razi, most of which are about medicine. The most important one is the book called *Al-Hawi* which we will discuss later. Another book is *Al-Mansuri*, or Mansuri Medicine, which has been compiled for Amir Ibn Mansur Ibn Ishaq Samani the ruler of Rey. This book is divided into two sections and is briefer than *Al-Hawi*.

In the Middle Ages, *Al-Mansuri* was translated into Latin and it has been reprinted numerous times since then. Other books by Razi are *Borhan*, *Tibbun Nufus* and a book called *Quality of Sight*, another book which is concerned with the diseases of the joints of the body and there is a book about avoiding extremes. The Arab Jalinus Razi, has made a lot of objections and criticisms in the ideas of the famous physician Galenus in a book *Al-Shakuk*. The book called *Man la Yahdharul Tayb* is one of the famous works of Razi and Ibn Abi Usaybiah has called it the medicine of poor people; because in this book he has outlined simple and inexpensive instructions for treating patients which is very helpful for the deprived segment of society. In many of his instructions a doctor's advice is not needed¹.

The book *Bur'a Sa'a* is another of Razi's works describing the treatment of emergency cases before reaching a doctor.

In a book called *Al Tibbul Muluki* Razi proposed the treatment of all diseases with food, not medicine. This method of curing was a new method and since that time, has gained a lot of supporters.

Other books by Razi are too numerous to mention individually. In addition to books, there are many articles said to be written by Razi in the Middle Ages which were translated into Latin and, after the invention of the printing machine, were printed often².

Al-Hawi- A Medical Encyclopedia

The most important and the biggest work of Razi is a world famous book called Al-Hawi, which has been called the 'general book on the science of medicine'. This encyclopedia identified and discussed all or most of the problems facing medical science at that time. The ideas and methods of treatment of the ancient Greeks, Iranians and other scientists have also been collected in this book. European physicians, in particular the medical society of Italy and the doctors in this land, have gotten much benefit from the book, and the ancient scientists had a very strong belief.

in this book. Many historians have mentioned Razi's book with respect. Aruzue Samarghandi, in a book called Four Articles in the section of "medical signs" wrote that every doctor should read Galenus's book, Al-Rawi, which has been written by Razi and Qanun, written by Ibn Sina, and derive benefit from these books.

Regarding Al-Rawi, it has been noted that during his lifetime, Razi did not succeed in collecting and putting the chapters in order; he just wrote them like notes and after his death, Ibn al-Amid nicknamed Sahib Ibn Eebad paid a lot of money to Razi's sister to collect all of her brother's notes. With the assistance of his students, he put them in order and it was published. Some researchers believe that this book is thirty volumes. Ibn Nadeem, in a book called *Al-Fihris*, and Ibn Usaybiah in a book called *Ayunul Anbaa*, said that this book has twelve sections. The importance the Europeans place on this book, in Razi's treatments and results of his patients' treatment have all been reflected in this book, and Razi noted all his observations in the book.

For the first time, the book *Al-Hawi*, was translated to Latin in Italy and two volumes were published in the 1486 and later this book was re-published in Venice, Italy, in the year 1509 and 1542.

The manuscript of this book is available in the British Museum, Munich Library, Oxford and Cambridge Libraries, Excoria Library of Spain, the Library of Salimaqa in Istanbul, Suliemaniyya Library, Shahid Ali Pasha Library in Istanbul, Musa Library, Astane Quds Library in Mashad, Modarres Library in India and Malik Library in Tehran.

Abu Raihan Muhammad Ibn Ahmad al-Biruni- Another Muslim Scientist

Abu Raihan Biruni, one of the great scientists of the fourth hijrah century, approximately a thousand years ago, was born in the north of Khorasan province in Iran. He made discoveries in mathematics, astronomy, history, social sciences, and philosophy and wrote many books in Persian and Arabic. His scientific contributions include the accurate determination of the density of eighteen different metals and mineral stones. He calculated the sine and cosine of angles from zero to 90 degrees and recorded them in a table.

One of his discoveries was the measurement of the radius of the earth using a new and difficult method. He measured the radius of the earth twice, once from a mountain peak in the Hindukush mountains in Afghanistan and the other time from the peak of a high mountain next to a flat plain when he was travelling to India.

According to the figure in order to measure the radius of the earth through this method one should climb to the peak of a high mountain which overlooks a flat plain.

(Mountain is indicated with the height of AH in figure (1) but as we know the irregularities on the surface of the earth are insignificant in respect to the largeness of the earth but in order to make the mountain recognizable in the figure we drew it bigger than its real size.

The horizon should be drawn on top of the mountain (But how?) Abu Raihan then by using an instrument similar to today's telescope overlooked the surface of the earth and measured the angle(α) between the horizon (AH) and the tangent line to the earth's surface (AC) which was a small angle about 30 minutes (half a degree). By measuring the height of the mountain's peak (AH) and using the following equations, he measured the radius of the earth.

In the right triangle of (OAC), the equation could be written as:

Therefore, by measuring the angle (α) and the height of the mountain (h) the radius of the earth could be measured, through Abu Raihan's method.

Have you ever considered how the height of a mountain could be measured? Abu Raihan Biruni in his book entitled Ghanoon Masoudi which is an astronomical book, described the measuring method of a mountain's height. Figure (2) shows this method which is still used today.

[1.](#) Uyan ul Anbaa, Vol. 1, page 314–315.

[2.](#) History of Literature, by Dr. Safa

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