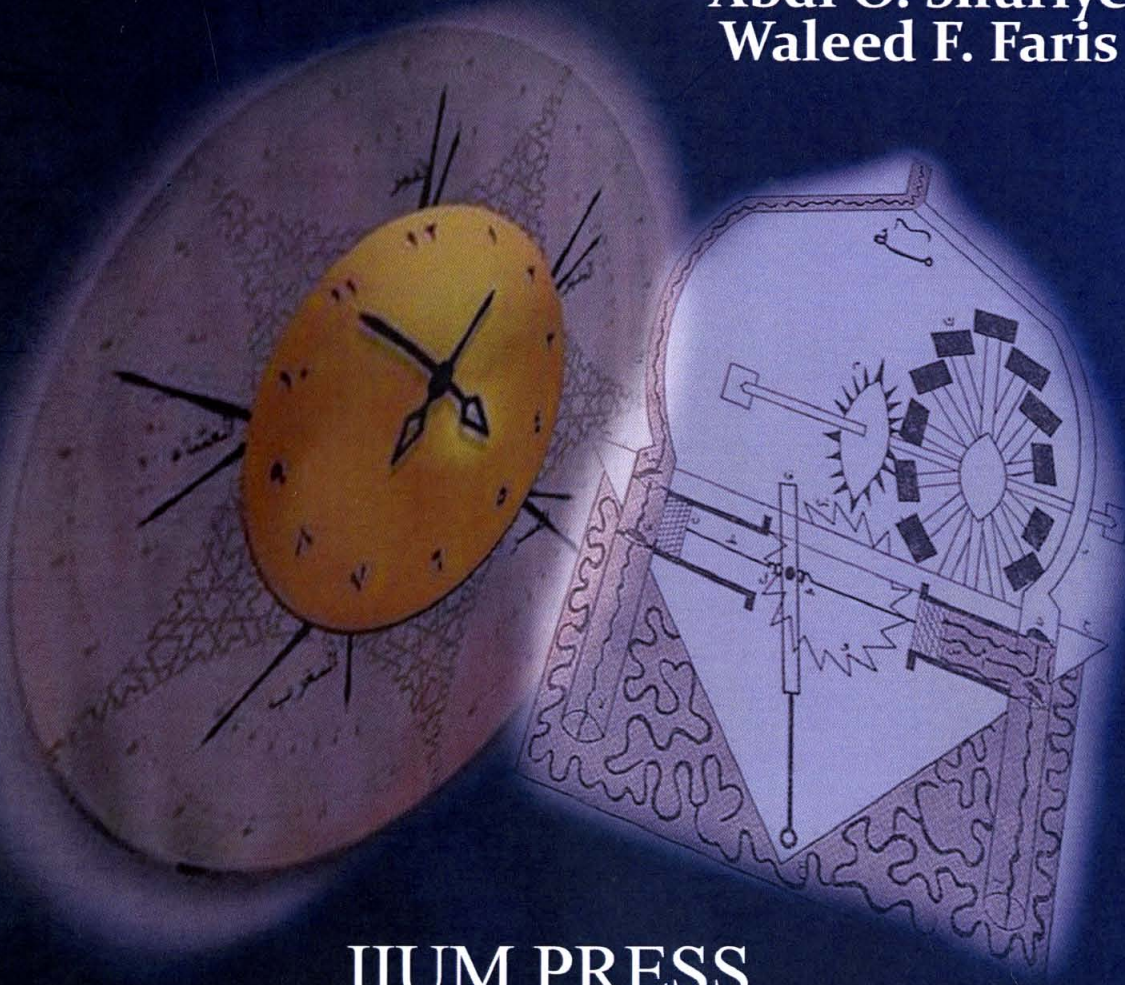


Contributions of Early Muslim Scientists to Engineering Studies and Related Sciences

Abdi O. Shuriye
Waleed F. Faris



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Editors

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CHAPTER ELEVEN

AL-KASHI AND ACCESS TO THE ARITHMETIC & ASTRONOMY

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11.1 INTRODUCTION

Muslim scientists played a significant role in the history of science. There were hundreds of notable Muslim scientists who made great contributions to the society. Muslims carried the torch of learning for five hundred years; from 8th century to 13th Century. It is worthy to mention that engineering has an impact to develop human life especially when we know that this includes various fields such as mathematic, physics, astronomic, architecture, optic and other types which have relation with this word. So the objective of this chapter is to focus the light on Muslim scientists' contributions in this science. Also the significance of this chapter is to research the contributions of Al-Kashi in astronomical and mathematical issues. The methodology is purely on library based study using books, journals and other relevant sources. In this chapter we will discuss Ghiathudin Al-Kashi. He was born in 1380 in Kashan, a town modern in Iran.

11.2 HIS NEW ASTRONOMICAL INVENTION

In 1416 CE al-Kashi completed two new works, *Risala dar sharh-i alat-i rasd* (Treatise on the Explanation of Observational Instruments) and *Nuzha al-hadaiq fi kayfiyya san'a al-ala almusamma bi tabaq al-manatiq* (The Method of Construction of the Instrument Called Plate of Heavens). This book contains a description of his invention, a device to predict the positions of the planets. Thus, he went deeply in the astronomical field and established famous tables. Al-Kashi's astronomical tables were based on an earlier work done by another Persian, Nasir al-Tusi. These were used to calculate the coordinates in the heavens, helped astronomers' measure distances, and predicted the motion of the sun, moon, and planets, as well as longitudinal and latitudinal parallaxes. (Gale Group, 2001).

The Islamic world was profoundly interested in such navigational aids because of the qibla, the direction that a Muslim needed to face for prayer. Since 624 CE, devout Muslims who followed the five pillars of their religion had been instructed to face the Saudi Arabian city of Mecca, Islam's holy city, five times daily when they prayed. Many Muslims were traders, or traveled on other business, and used a complex measuring device called an astrolabe to find the direction of Mecca so that they could fulfill their religious obligation without error. (Gale Group, 2001)

Ulugh Beg invited Al-Kashi to teach at the University of Samarkand. He became its leading astronomer, and later in the century was described by a historian as the second Ptolemy, referring to the second-century Greek astronomer who lived and worked in Alexandria, Egypt, when it was the greatest center of scientific scholarship. Ptolemy preserved what had been known about the stars since the first Greek astronomers, named