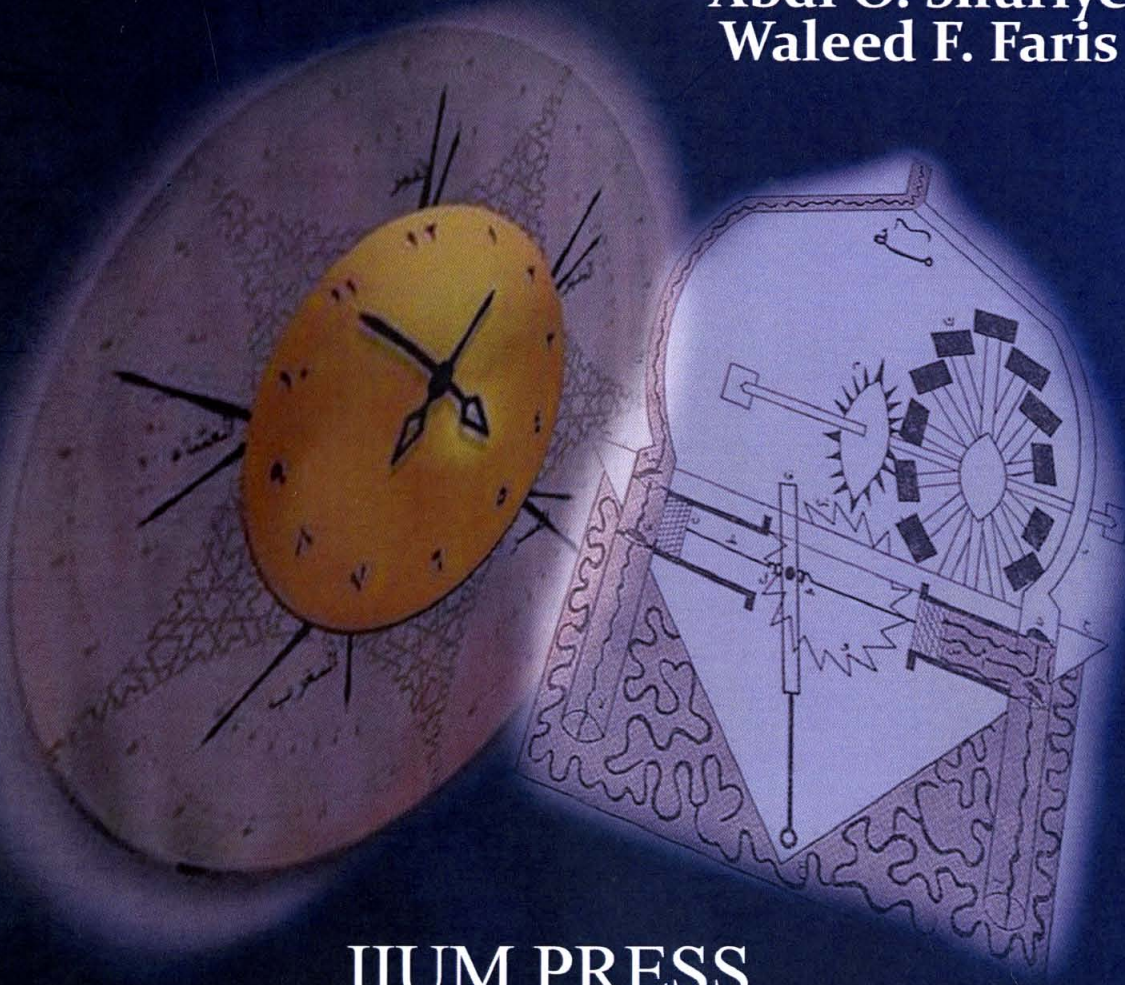


# Contributions of Early Muslim Scientists to Engineering Studies and Related Sciences

Abdi O. Shuriye  
Waleed F. Faris



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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA



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Abdi O. Shuriye  
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## CHAPTER TWENTY NINE

### THE CONTRIBUTION OF BANU MUSA BROTHERS IN THE SELF CHANGING FOUNTAIN

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#### 29.1 INTRODUCTION

Musa Ibn Shakir lived in Baghdad during the rule the Abbasid Caliph al-Ma'mun and was among his closest courtiers. Al-Ma'mun took them under his wings and appointed Ishak Ibn Ibrahim al-Masbaghi to take care of them. This latter placed them in Bayt al-Hikmah (the House of Wisdom), which hosted an important library, an astronomic observatory, and a translation centre of Greek philosophical and scientific works. Banu Musa brothers grew up in this scientific environment, and became among the outstanding scholars of Bayt al-Hikmah. The oldest brother named Muhammad, followed by Ahmad, and then the third named al-Hasan. Their work in science are different is due to interest and their own areas of expertise. Muhammad was known as an expert in the field of geometry and astronomy, while Ahmad is focused on mechanics and al-Hasan excellent, especially in geometry (Helaine, 1997, p. 151).

The objective of this chapter is to list the contribution of Banu Musa in the mechanic and control engineering, focusing on the self changing water fountain. Even though Ibn Musa brothers excelled in the various fields such as mathematics, astronomy, and geometry and contributed to their development by their important innovations and discoveries, their scientific contributions in mechanics has become a reference and the main contribution to this day. It appeared in the invention of a series of scientific tools and automatic devices, such as a number of farming machines, fountains which show numerous images with ascending waters. They also invented a number of household devices and toys as well as machines for loads traction, lifting or weighing (Banu Musa, 1979, p.4).

This chapter is describing the contribution of Banu Musa in the most known by their achievements in mechanics, the light of modern system, innovation in water fountain and other automatic control mechanisms that have been written in their most famous book, *Kitāb al-hiyal* (The Book of Ingenious Devices), in which they compiled old mechanics as well as their personnel experiences. The method adopted in this chapter is to conduct a study library, searching and reading of relevant reference books and also research on the ancient work of Banu Musa, which is *Kitāb al-hiyal* itself.

This chapter examines how Banu Musa, innovate and create system that is not there at that time and documented until it becomes one of the main reference in the world at present.

The significance of this chapter is to inculcate an attitude of innovation and creativity of Muslim thinkers in the past as exemplary of the Banu Musa success story itself.