

THE HISTORY AND PHILOSOPHY OF ISLAMIC SCIENCE

OSMAN BAKAR



ISLAMIC TEXTS SOCIETY

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Contents

<i>vii</i>	Preface
Part One	The Epistemological Foundation of Islamic Science
<i>1</i>	<i>Chapter 1</i> Religious Consciousness and the Scientific Spirit in Islamic Tradition
<i>13</i>	<i>Chapter 2</i> The Question of Methodology in Islamic Science
<i>39</i>	<i>Chapter 3</i> The Place of Doubt in Islamic Epistemology: al- Ghazzālī's Philosophical Experience
Part Two	Man, Nature, and God in Islamic Science
<i>61</i>	<i>Chapter 4</i> The Unity of Science and Spiritual Knowledge: The Islamic Experience
<i>77</i>	<i>Chapter 5</i> The Atomistic Conception of Nature in Ash'arite Theology
<i>103</i>	<i>Chapter 6</i> An Introduction to the Philosophy of Islamic Medicine
Part Three	Islamic Science and the West
<i>131</i>	<i>Chapter 7</i> The Influence of Islamic Science on Medieval Christian Conceptions of Nature

157 *Chapter 8*
"Umar Khayyām's Criticism of Euclid's Theory of
Parallels

Part Four Islam and Modern Science

173 *Chapter 9*
Islam and Bioethics

201 *Chapter 10*
Muslim Intellectual Responses to
Modern Science

227 *Chapter 11*
Islam, Science and Technology: Past Glory,
Present Predicaments, and The Shaping of The
Future

243 **Appendix**
Designing a Sound Syllabus for Courses on
Philosophy of Applied and Engineering Sciences in
a 21st Century Islamic University

253 **Index**

Preface

The essays presented in this book deal with various facets of the history and philosophy of Islamic science. By 'Islamic science' we mean the totality of the mathematical and natural sciences, including psychology and cognitive science, cultivated in Islamic culture and civilization for more than a millennium beginning from the third century of the Islamic era (the ninth century of the Christian era).

These sciences are Islamic not just because they have been produced by Muslims. As a matter of fact, many non-Muslims made important contributions to the growth and development of Islamic science. Rather, these sciences deserve the name 'Islamic science' because they are, conceptually speaking, organically related to the fundamental teachings of Islam, the most important of which is the principle of *tawhīd*. This book seeks to reveal different dimensions of the organic link that exists between *tawhīd* and science as seen through Muslim scientific eyes.

The essays cover four major themes, namely, (1) the epistemological foundation of Islamic science, (2) Man, Nature, and God in Islamic science, (3) Islamic science and the West, and (4) Islam and modern science. Through these essays, we seek to convey the important message that Islamic science, the most immediate predecessor of modern science, shares with the latter many outstanding features such as the rational and logical nature of its language, the adoption of scientific and experimental methods of inquiry, and the international character of its scientific practice and organization.

However, we strongly feel that it is incumbent on us to highlight the fact that there are also important differences between the two sciences. Islamic science is at the same time of a religious nature in the sense that it is consciously based upon the

metaphysical, cosmological, epistemological, and ethical and moral principles of Islam. In the light of its spiritual and moral conception of nature, Islamic science adopts goals and methodological principles that are different in several respects from those of modern science. In Islamic culture, the place of science in relation to other branches of knowledge such as the religious and social sciences is also somewhat different from the one we see in modern Western culture.

A salient feature of our essays is their interdisciplinary character. We have also adopted a blend of historical and philosophical approaches to the study of Islamic science. We hope this book is of value for all who are concerned with the problem of knowledge in all its dimensions, whatever their discipline.

Except for chapters one, five, ten and eleven, all the essays have previously appeared in learned journals or as chapters of books published outside Malaysia. They are reprinted here with only minor changes:

"The Question of Methodology in Islamic Science," *Muslim Education Quarterly*, 2:1 (Autumn 1984), pp. 16-30; also published in *Quest for New Science: Selected Papers of A Seminar*, Centre for Studies on Science, Aligarh (India), pp. 91-109.

"The Meaning and Significance of Doubt in al-Ghazzālī's Philosophy," *The Islamic Quarterly*, 30:1 (1986), pp. 20-31; also in *Iqbal Review*, April - June 1985, pp. 29-48.

"The Unity of Science and Spiritual Knowledge: The Islamic Experience," in R. Ravindra (ed.), *Science and Spirit* (International Cultural Foundation: New York, 1990), pp. 87 - 101.

"The Philosophy of Islamic Medicine and Its Relevance to the Modern world," *MAAS Journal of Islamic Science*, 6:1 (Jan - June 1990), pp. 39-58.

"Umar Khayyām's Criticism of Euclid's Theory of Parallel Lines," *MAAS Journal of Islamic Science*, 1:2 (July 1985), pp. 9-18.

"Islam and Bioethics," *Greek Orthodox Theological Review*, 31:2 (1986), pp. 157-179.

"Designing a Sound Syllabus for Courses on Philosophy of Applied and Engineering Sciences in a 21st Century Islamic University," *Muslim Education Quarterly*, 7:3 (Spring 1990), pp. 19-25.

The essays brought together here have been written over a period of about seven years, the earliest being published in 1984. Entitled "The Question of Methodology in Islamic Science," the essay was originally presented as a seminar paper at an international seminar on *The Quest for New Science* held at Aligarh University, India in April 1984 and organized by the Center for Studies on Science, Aligarh. Other essays originally written for international seminars/conferences are chapter four (presented at the *Unity of the Sciences Conference* in Los Angeles), chapter six (presented at *International Seminar on Islamic Philosophy and Science* in Penang), chapter nine (presented at a conference on *Muslim-Orthodox Christian Relations* in Boston), and chapter eleven (presented at the *International Conference on Islamic Civilization* in Kuala Lumpur).

In bringing together a collection of essays written over a long period of time and covering so many topics and issues, even if these are one's own, there is always the problem of thematic unity which one must address. That there is a thematic unity in our essays presented here we are quite satisfied. In fact, we can claim that the said problem has never arisen at all in our case, primarily because the essential intellectual framework of our philosophy of science has remained unchanged ever since we first embraced it in 1971 when we were a postgraduate student in mathematics (specializing in *group theory*) at Bedford College, University of London.

We are grateful to Dato' Hj. Musa Mohamad, the Chairman of the Board of Advisors, the Secretariat for Islamic Philosophy and Science, the Science University of Penang, and also the Vice

Chancellor of the University, for being kind enough to publish this work. We also wish to thank Nurin Enterprise for having agreed to be a co-publisher.

It also affords me great pleasure to record my sincere thanks to the University of Malaya. Most of the essays brought together here were written during our doctoral studies in Islamic philosophy at the Department of Religion, Temple University, Philadelphia. Our postgraduate studies (1981 - 1986) were financially supported by the University of Malaya.

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Dean's Office,
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May 1991

THE HISTORY AND PHILOSOPHY OF ISLAMIC SCIENCE

OSMAN BAKAR

THE ESSAYS PRESENTED in *The History and Philosophy of Islamic Science* discuss the principles behind the different sciences cultivated in the Islamic world from the third century of the Islamic era onwards and the place of science in relation to the other branches of Islamic learning. In defining what Islamic science means, Professor Osman Bakar shows how these sciences are organically related to the fundamental teachings of Islam. Covering all the natural and mathematical sciences, *The History and Philosophy of Islamic Science* illustrates what Islamic science shares with modern science: the rational nature of its language, the adoption of scientific and experimental methods of inquiry, and the international character of its scientific practices, organisations and institutions. But Professor Osman Bakar also highlights where the Islamic approach to science differs from the secular modern approach. Being based on the metaphysical, cosmological, epistemological, ethical and moral principles of Islam, Islamic science adopts goals and methodological principles that are different in several respects from those of modern science. The great attraction of *The History and Philosophy of Islamic Science* is its interdisciplinary character. The book is of value to all those concerned with the problem of knowledge in all its dimensions.

[Osman Bakar's book] marks a most valuable contribution both to the effort of revealing the Islamic intellectual and spiritual approach to science, and to the concomitant endeavour to highlight the deeper causes of the contemporary crisis in Western science and technology... it opens up, with clarity and simplicity, the philosophy of Islamic science.

ISLAMIC QUARTERLY

Professor Dato' Dr Osman Bakar is Vice Chancellor (Academic) of the University of Malaya, Malaysia and an authority on Islamic science. Among his other titles published by The Islamic Texts Society is *Classification of Knowledge in Islam*.



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