Islam and the Quest for Modern Science

Conversations with Adnan Oktar, Mehdi Golshani, Mohammed Basil Altaie, Zaghloul El-Naggar, Bruno Guiderdoni and Nidhal Guessoum

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SWEDISH RESEARCH INSTITUTE IN ISTANBUL – TRANSACTIONS VOL. 21

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Cover: Monica Di Pietro.
Coverdesign: eddy.se ab

Printed by Elanders Sverige AB, Mölnlycke 2014

ISBN 978-91-978813-2-6
ISSN 1100-0333

Dedicato
a Beatrice Collina
che c'era quando questo libretto è stato concepito
e ci ha sempre creduto

Table of contents

Acknowledgements

Three conventions are generally observed when writing the acknowledgements for a book.

First, one takes responsibility for all the inaccuracies or omissions possibly contained in the book. This convention is sacrosanct and I do not intend to deviate from it.

Second, one thanks all the people and institutions directly involved in the book's making. I am willing to abide by this convention as well. At its very beginning, my postdoctoral investigation was encouraged with great open-mindedness by Maria Carla Galavotti, Wolfgang Spohn and Eva Picardi who provided me with their wise advice on all things academia, patiently turning a blind eye to the undeniable fact that to all of them I have been a rather indocile pupil. Later on, the project found an academic home first at the Excellence Cluster EXC-16 'The Cultural Foundations of Integration' at Constance University, and then at the Center for Middle Eastern Studies (CMES) at Lund University. I am deeply grateful to CMES director Leif Stenberg for the opportunity to carry out my research in a stimulating climate of great freedom and friendliness. I express my warmest gratitude to my six interlocutors for their time and patience. It is my hope that I have rendered their respective positions in a complete and sufficiently fair way, and that our dialogue will continue. I extend such thanks to Ziauddin Sardar for an unpublished interview that has greatly contributed to my knowledge of the current debate on Islam and science. Rainer Brömer greatly helped me with scholarly advice and with the logistics of my first stay in Istanbul. My warmest thanks go to His Excellency Alberto Bradanini and his spouse Germana Rivi who generously hosted me and my travel companion Stefano Quaglia at the Italian Embassy in Tehran. Niss Stricker greatly assisted me in a not completely successful French expedition on the traces of Maurice Bucaille. Nathan Teitgen helped me in communicating with Mme Bucaille. Bahar Ay helped me to check the correspondence of the English translation of Mr Oktar's answers in Turkish that were translated by a collaborator of Mr Oktar himself during our encounter; Mohamed El Meadawy helped me with the transcription of some Arabic terms occurring in Professor El-Naggar's interview. Darcy Thompson, Christa Salamandra, Liesl Drew, Peter Bagin, Olof Heilo, as well as two anonymous reviewers have patiently read different drafts of this book and provided me with precious advice as to its form and content. Tauseef Ahmad has generously contributed to the book with his Glossary. Kay Hutchings' assistance in the form of rapid and thorough proofreading of my work was much appreciated. Marianne Boqvist patiently supervised all the stages of the book's production. I strongly benefited from valuable suggestions regarding specific methodological aspects of my research and topics from, and I am therefore much grateful to, (in alphabetical order) Mona Abaza, Jon Anderson, Halil Arda, Helen Avery, Ebrahim Azadegan, Ian G. Barbour, Rafah Barhoum, Sonja Brentjes, Raffaella Campaner, Amir Dastmalchian, Michael Degerald, Taner Edis, Joel Elliott, Paolo Giglioli, Andreas Görke, Salman Hameed, Jan Hjärpe, Pervez Hoodbhoy, Eric Hooglund, Damian A. Howard, Toby Huff, Antje Jackelén, Roy Jackson, Torsten Janson, M. Zaki Kirmani, Bernhard Kleeberg, Giulia

Lasagni, Ulrika Mårtensson, Ronald L. Numbers, Jonas Otterbeck, Harpal Singh Pannu, Francesco Piraino, Catharina Raudvere, Martin Riexinger, Anne Ross Solberg, Nils-Eric Sahlin, Nathan Schneider, Mark Sedgwick, Bhupinder Singh, Sarbjinder Singh, Mikael Stenmark, Richard Swinburne, Dorothea Weltecke and Umeyye Isra Yazicioglu.

According to a third convention, one should individually thank all those indirectly involved in the book's making. I must here mention with deepest gratitude and affection David Idris Byström, who was courageous enough not to run away from difficulties and whose caring support has been invaluable, especially during tough times. However, mentioning everybody else is impossible. Over the years during which I was busy with my research on Islam and science, I have been supported and helped on innumerable occasions by fellow scholars, colleagues, relatives, friends, flatmates, travel companions, language teachers and students all over the world, and with overlaps among such categories. Any attempt at just listing their names would result in the rather uninteresting and cold caricature of a telephone book – and an incomplete one. All I can do is to assure them that in the years to come I will try to the best of my ability to reciprocate their help, support and friendship.

A shared apartment in
Mexico City, December 2013

Foreword

In Muslim societies, discourses on the meaning of Islam have more or less always included thoughts on knowledge, rationality and science. This is not unique; most religions share similar experiences in which religious scholars attempt to form theologies that contain explanations of natural phenomena in order to justify religious belief and practice. In contemporary times this can be exemplified by referring to religious interpretations that address modern science, especially natural sciences, from theological perspectives. In my personal experience as a student of Islamic traditions and Muslim practices, I have been involved in numerous discussions in which my interlocutors have taken a position that explains nature and evolution through a lens of Islamic terminology. For example, during fieldwork in Damascus between 1999 and 2000 I recorded Friday prayers in a mosque. In the majority of them the preacher included recent findings in modern science and explained how all examples were either already mentioned or predicted in the authoritative sources of Islam or how the findings corresponded primarily to passages in the Qur'an. His statements certainly postulated a particular interpretation and a process of conceptualization of the Qur'anic text, but what is also of interest is the reception of his words. During my stay, and on many later occasions, I have had the opportunity to discuss the reception of the preacher's statements among his young disciples and generally their opinions resembled the preacher's ideas and truth claims. The type of assertions they expressed have sometimes been labelled by the term 'Bucailleism', referring mainly to the French physician Maurice Bucaille's statements on the comprehensiveness and infallibility of the Qur'an in relation to modern science. The young disciples have rarely read a book by Bucaille, but they know his name and they have adopted widespread ideas presented as Bucaille's opinions. However, these statements on the infallibility of the Qur'an are only one stream of thought in a Muslim discourse out of many. In the Muslim world, in this case understood as a world of ideas rather than a physical geographical area, there are a variety of interpretations presenting truth claims about the interconnection between Islam, knowledge and science.

Contemporary interpretations of Islamic traditions reflecting on modern science appear in a variety of circumstances. It is certainly part of a process in which religious scholars attempt to address the challenges of modernity, and as such it can be part of classic philosophical discussion among religious scholars at theological schools, but it can also be a hot topic concerning questions of identity among young suburban Muslims in Europe. Moreover, conceptions of an Islamic narrative of creation that challenges the theory of evolution and supports the idea of Islam as God's ultimate and final revelation can appear as a form of subculture among Muslims, and also an argument used to convince potential converts. One significant point is that the many and lively discussion among Muslims globally on Islam and science in general has not generated much scholarly interest. Hence, this book is a timely and much needed contribution presenting some of the positions in a discourse on Islam and science.

Islam and the Quest for Modern Science consists of interviews with a number of authors and scholars that discuss Islam and science from a confessional position.

Those identified as 'new generation' differentiate from an earlier generation of Muslims interpreting Islamic traditions in order to make sense of – and theologically understand – modern science. One of the differences concerns their academic background and their professions. The persons interviewed in this book diverge from prolific persons discussing Islam and science such as Seyyed Hossein Nasr or Ismail al-Faruqi (d. 1986) since they all work in the field of natural sciences. They are trained in what perhaps can be described as secular disciplines and they have no formal training in theology or religious studies. Somewhat simplified, in regard to Islamic theology, an overall ambition regardless of whether you belong to an old or new generation is to create a comprehensive Islam that makes statements not only about religious practicalities, but also the latest innovations in natural sciences. However, from the perception of Islamic studies it is unquestionably interesting and fascinating to follow how persons educated in natural sciences, but not in Islamic religious studies, interpret Islam and produce statements in the name of 'Islam' from a scientist's and layperson's perspectives.

One question is if such a new generation and their interpretations of Islam will influence global discourses on the meaning of Islam as well as everyday opinions of Muslims. In this context, political, economic, social and religious aspects are vital since they all influence policies within higher education, discussions among religious scholars concerning interpretations and the location of understandings of Islam in public spheres. Another question that can be highlighted concerns the discourse on Islam and science itself, especially the consequences of laypersons producing what can perhaps be perceived as forms of entrepreneurial interpretations of Islamic traditions aimed to explain the intriguing story of creation in new ways. The interplay between interpretations carried out by formally trained scholars and laypersons challenges established power structures in Muslim societies and may influence the reception of ideas on the broader relationship between Islam, knowledge production and modern science. Hence, the increased interest among Muslims globally about questions that concern the heart of any theology – how to explain the creation of the world and thereby humans and their existence – are not only essential, rather they define the role and function of religion in society. However, this process is discursive, volatile and elusive in style.

The author of this book, Stefano Bigliardi, has an academic training specializing in philosophy, but complements his philosophical competence with Islamology. This combination serves him very well in writing this book and is significant for his approach to analysing the dialogue. His knowledge of philosophical matters linked to the discussion on Islam and modern science is crucial and the reader will find his questions carefully chosen as well as intriguing. Hence, one of the many aspects that make this book important is the author's knowledge of the subject. Furthermore, the book is also significant since it is one of the first studies that presents and analyses the standpoints of a new generation of Muslims discussing modern science and Islam. The outcome is an exceptional and stimulating study portraying the variety of outlooks on how to comprehend a religious tradition. It certainly displays a motivation to interpret Islam among Bigliardi's interlocutors, but also the many problems involved if the ambition is to create a contemporary and comprehensive theology.

In sum, Muslims as well as believers in all religions have always grappled with how to religiously understand and explain developments in society. In more recent times, the many interpretations that exist regarding almost all issues in human life display a plurality of opinions on the 'true' meaning of Islam. *Islam and the Quest for Modern Science* is an excellent introduction to questions that, from a Muslim and confessional position, can be understood either as a challenge, a threat or a possibility. Muslim approaches, confessional or not, toward modern science are undoubtedly diverse, and how to Islamically understand modern science is a key topic at the core of today's discussion on the function of Islam. Therefore, this book is an important contribution that not only fills a gap in the study of Islam, but also portrays a discourse that touches upon fundamental questions in the production of Islamic theologies and the understanding of Islam among Muslims in general.

Leif Stenberg

Introduction

On a loud, sweltering evening in the summer of 2007, I was lying on a bare mattress on the floor of a shared apartment in Alexandria, Egypt reading the Italian translation of the Qur'an by Alessandro Bausani.[1] Many factors had been silently and inexorably conspiring for years to lead me to that specific mattress, on that specific evening, with that specific reading. Love of intellectual challenges and foreign languages had attracted me to Arabic, Arabic studies had attracted me to Egypt, and immersion in a Muslim country had attracted me to the Qur'an.

Paying particular attention to the long footnotes and often reading the same passages over again, I slowly moved through the old-fashioned, literary prose in which the illustrious scholar had rendered the message revealed to the Prophet 1,400 years earlier. Inevitably, I came across the opening of sura 54: 'The Hour is nigh, and the Moon is cleft asunder'.[2] This passage intrigued me more than possibly all I had read up to that point. The related footnote, explaining that different exegetes of the Qur'an had variously interpreted the splitting of the Moon, did not quench my curiosity.[3]

The following day I turned for insight to my teacher Saber, respected for his religiosity as well as for his vast knowledge of all things Arabic. Arabic is a language that teaches humility. If it is not your mother tongue, you should always say that you are learning it and approach it reverentially. This holds especially true for a beginner. However, I was in a daring mood: with my elementary skills I tried to formulate a question. '*Ya* Saber. I was reading the Qur'an yesterday and I read that the Moon was split. What does it mean?' Saber looked at me, puzzled. In order to say 'split' I had actually used *mukassar*, the term for 'shattered', instead of the proper correspondent of 'cleft asunder': a participle that one should use for pottery, not for our satellite in a Qur'anic context. Nevertheless, Saber grasped my question. Guessing that my language skills were insufficient to understand a complex answer in Arabic, Saber, who was beloved among colleagues and students for his sweetness of character, gently switched to English and replied with a smile: 'The Moon was split. That was a miracle of the Prophet. Some say they do not believe it. As to me, I do believe it happened. Years ago, NASA astronauts found the signs that it had happened. So, I believe.'

My scepticism at first prevented me from believing what my teacher was saying. I grew up in Italy, in a cultural environment strongly influenced both by Catholicism and anti-clerical atheism, an environment in which the controversies over miracles such as the periodic liquefaction of St Januarius' blood, or Saint Pio of Pietrelcina's stigmata, are as vehement as the veneration that those very wonders inspire. Since childhood I was familiar with biblical narratives and

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[1] Bausani 1988.

[2] For an explanation of the criteria adopted for Qur'anic quotations as well as the transcription of Arabic terms and names, see the *Notes on the conversations*.

[3] Cf. Bausani 1988, 670.

doctrines about supernatural deeds and had always perceived them as a major challenge for the acceptance of religious discourses and practices. As a young man I remember myself addressing in a defiant tone an irritated Christian preacher in Hyde Park's Speakers' Corner by scornfully questioning the credibility of Jesus walking on water. Later, my philosophical studies had taught me that miracles are an intellectually respectful concept, suitable to subtle debates rather than derision. However, I remained unable to swallow the report of a miracle on the spot.

Moreover, what really interested me was not the miracle *per se*, but rather a sort of anomaly that I sensed behind my teacher's words. I was indeed familiar with people believing in miracles and wonders, but I had hardly heard anyone immediately supporting such a belief with reference to some scientific discovery. It was not that the NASA narrative sounded credible to me, but that the structure of the argumentation was puzzling. In the course of my studies I had of course read *Fides et ratio*[4] and other works aimed at arguing for the harmony of science and religion from a Christian point of view. However, in non-academic conversations I was more familiar with a commonsensical, instinctive separation of science from religion. I remember standing in a long queue in 1998 in order to observe the shroud in Turin and hearing a woman say: 'Science says otherwise, but we, as Christians, must believe.' I was, in other words, aware of highly intellectual attempts at demonstrating, in the Christian milieu, the harmony of science and religion, but not of a kind that had neither been able to reach believers' day-to-day reasoning nor to substantiate proselytizing attempts. Furthermore, I was not aware of any direct attempt at supporting religious beliefs through science. Was it a coincidence? Had I listened to some whimsical, idiosyncratic conviction of my teacher?

Miracles, science, Islam – I decided to dig deeper into this issue. There began a long series of conversations with Saber himself and other Muslim colleagues. Over dinner I received other interesting inputs: I heard, for instance, enthusiastic comments about a professor called El-Naggar, who was popularizing scientific facts supposedly described in the Qur'an. 'What about Darwin?' I asked at some point. 'Did you study his theories in school?' 'Yes' was the answer, followed by 'and we studied that he was crazy'. When the conversation touched upon issues such as science and education, I often heard complaints regarding its low quality and the need to catch up with 'the West'.

Meanwhile, I completed my reading of Bausani's rendition of the Qur'an. I also began to plough through the Internet in addition to Alexandria's bookshops. These efforts proved especially rewarding. I became familiar with a large array of books, some printed on low quality paper, some available in extremely lavish editions. Common to all of them was their persistent association of the term 'miracle' to natural phenomena. Furthermore, miracles as a topic were focused upon on in an ancient Qur'anic commentary by Ibn Kathir (1301–1343 CE),

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[4] The encyclical letter (15 September 1998) in which John Paul II defended the harmony of faith and reason. Available at: http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_15101998_fides-et-ratio_en.html.

All websites have been accessed for a final check in December 2013.

which I found alongside contemporary books on Islam and science.[5] I even came across a thin pamphlet in Italian advocating from its very title the 'compatibility' of Islam and modern science.[6] A volume edited by a Turkish scholar familiarized me with a more academic approach to the harmony of Islam and science.[7]

My interest in the debate on science and religion as it is carried out in the Muslim world grew increasingly strong. At that time, engaged as I was (with some reluctance) in a doctoral thesis regarding a severe, logical theory of belief invented by a German professor, I had a specific and somewhat limited concept of 'philosophy of science'. For me it rather meant the highly formalized and compartmentalized discussion of notions such as probability, belief, cause, effect, explanation and so forth. I was not familiar at all with a philosophy of science that directly engages in a relationship with religious concepts. I thus decided to explore what for me was a newly found archipelago. My interest slowly became a structured academic investigation, oriented along some main questions.

The landscape of our daily life is interspersed with sophisticated devices. Common sense often equates technology and science. Such an instinctive conceptual overlap, of course, can be questioned;[8] however, omnipresent technology invades our sensorial field from the very moment we wake, and constantly makes us think that something called 'science' is 'out there'. We are often reminded that science should be preserved and transmitted, if not for higher reasons, at least to maintain the commodities it affords us. At the same time, religious concepts still play a central and pervasive role in many people's lives. Sooner or later the thought of a confrontation between religious and scientific concepts crosses one's mind. How are the two fields thus defined, along what lines, and why? Are they accommodated or deemed contradictory? These seem to be general questions that can guide the investigation of science and religion in any culture. Muslims, more specifically, are bound to focus on Qur'anic concepts by reinterpreting this 1,400-year-old text. It might also be hypothesized that they face the perception, dating back to the colonial era, that modern science is culturally foreign and an instrument of hostile power. In the present post-colonial era the perception may remain that in technological development and scientific education Muslim countries are not as advanced as the so-called West. In addition to these factors similar to other religions, some scientific concepts, most notably Darwin's theory, can be seen as solvents of religious ones. In such a context, which authors discuss the relationship of Islam and science, in which theoretical framework and for which public?

Several months later, back in Germany, another encounter proved fundamental: it was the doctoral thesis of a Swedish scholar, who almost 15 years earlier had embarked on a similar adventure to my own. In *The Islamization of Science* (1996) Leif Stenberg focuses on four different authors and their respective interpretation of the relationship between Islam and science. Drawing on an

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[5] Ibn Kathir 2002.

[6] Naik, undated.

[7] Ünal 2007. It is a publication stemming from the Nur movement, inspired by the theologian Said Nursî (see Conversation with Adnan Oktar/Harun Yahya).

[8] See for instance Wolpert 1992.

astonishing amount of previously uninvestigated material, Stenberg examines the discourse on Islam and science without being part of it, and from an interdisciplinary perspective. The authors referred to by Stenberg are, in chronological order: the French surgeon and author Maurice Bucaille (1920–1998); the Palestinian-American scholar Ismail Raji al-Faruqi (1921–1986); the Persian-American scholar Seyyed Hossein Nasr (b. 1933); the British-Pakistani author Ziauddin Sardar (b. 1951). Let us start with a brief overview of these four authors' main theses and ideas, including mention of some of their works that appeared after the publication of Stenberg's monograph.

The first author's position can be easily summarized. M. Bucaille was a gastroenterologist with a passion for Egyptology who, according to his own narrative, learnt Arabic in his fifties after following the recommendation of some of his Muslim patients to read the Qur'an in the original version. Thanks to his contacts with the Egyptian president Sadat, Bucaille was allowed to carry out medical examinations of the thirteenth-century BC mummies conserved in the Egyptian Museum in Cairo, and identified one of them as the Pharaoh who died pursuing the Hebrews according to biblical and Qur'anic narratives. As a result of both his medical observations and his reading of several passages of the Qur'an, Bucaille became convinced of the text's divinity. He purportedly converted to Islam and continually defended his theses concerning the scientific soundness of the revealed text. Bucaille mainly expanded upon a few ideas, which can be summed up as follows: he pointed out that the Qur'an contains numerous references to natural phenomena and that it invites us to consider and observe them as signs of God; he held that the Qur'an does not contain any scientifically unsound statement, whereas the Old and New Testament are replete with contradictions and descriptions that clash with science; he criticized Darwinian evolution and advocated a theory of 'creative evolution', according to which God intervenes from time to time in creation in order to bring about the extinction or the appearance of new species while describing such thesis as compatible with Qur'anic passages regarding creation; finally, drawing upon a distinction between scientific *theories* (provisional and volatile) and scientific *facts* (established once and for all), Bucaille held that the Qur'an is factually accurate, containing statements that describe with precision specific events (such as the preservation of the Pharaoh's body and the circumstances of his death) as well as phenomena pertaining to the natural world (such as the development of the embryo in the mother's womb). Such descriptive accuracy ahead of the discovery or observation of those facts by scientists, according to Bucaille, can only be explained by (and demonstrates) the Qur'an's divine origin. Bucaille articulated such views in a few books and in numerous conferences worldwide.[9] As we will see, such ideas were far from new and original. However, Bucaille was able to weave them together and, more importantly, to promote them with his aura of a (supposedly) converted Western scientist, thus rising to the status of a celebrity in the Muslim world and generating a flow of similar books and pamphlets dedicated to this kind of exegesis. In the following pages I will refer to this trend as 'Bucailleism'.

[9] Bucaille 1976; Bucaille 1984; Bucaille and Talbi 1989; Bucaille 1990; Bucaille 1994. For a detailed analysis see Bigliardi 2011 and Bigliardi 2012.

I. R. al-Faruqi was a scholar of philosophy and religious studies who also had a talent for intellectual mobilization. His career as an academic stands out for its brilliant achievements; after having earned a BA in philosophy at the American University in Beirut, he was appointed at the age of 24 district governor of Galilee. Following the events of 1948, al-Faruqi moved to the U.S. where he earned two MA degrees in philosophy from Indiana University and Harvard respectively. From the former he received his PhD in philosophy. After four years spent at al-Azhar in Cairo, between 1959 and 1961, al-Faruqi was affiliated with McGill University in Montreal, Canada; subsequently he worked at the Central Institute for Islamic Research in Karachi, and he held positions in the U.S., respectively at the University of Chicago Divinity School, at the Department of Religion at Syracuse University, and finally at the Department of Religion at Temple University in Philadelphia, where he held a post as professor of history of religion and Islamic studies until his death.[10] al-Faruqi has been described as '(...) someone with top-level political connections at the centre of an extensive network of contacts' and '[who] resembled a militant country preacher, able to raise huge sums for research to fund Muslim students studying overseas [,] (...) a kind of academic manager'.[11] At the core of his thoughts and initiatives we can identify a basic political issue: al-Faruqi namely aimed to rejuvenate and unify the Muslim community, or *ummah,* which he saw as being in a state of crisis, unhappiness and fragmentation despite its enormous potential.[12] The cause of such fragmentation was identified by al-Faruqi as an intellectual disease: in his opinion, genuine Islamic thought had been infected by Western, destructive principles. These principles were transmitted either by direct contact with the West itself or by attempts by Muslim reformers to reshape Islam that were carried out with good intentions but entailed destructive results.[13] Among those principles, al-Faruqi particularly blamed nationalism, a 'despicable Western virus',[14] as well as scepticism for which al-Faruqi partly inculpated '(...) the success of science which is seen as the continuing victory of the empirical, over the religious mind'.[15] For al-Faruqi, the cure for this state was a return to genuine Islamic principles. Such principles were not only ethical but more importantly epistemological and often contrasting, in al-Faruqi's elucidation, with primary Christian ideas. For instance, al-Faruqi envisaged in the Christian concept of faith '(...) an implication of untruth, of probability, of doubt and suspicion'.[16] In opposition to this principle he proposed *iman*, the belief in truth described as 'absolutely free of doubt of probability, of guessing and uncertainty', the result of a rational appropriation of truth,[17] and a category that is both cognitive and ethical.[18] Equally cognitive and ethical, in al-Faruqi's view,

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[10] See Stenberg 1996a, 153–154.

[11] Abaza 2002, 77.

[12] Cf. al-Faruqi 1995, xiii.

[13] Cf. al-Faruqi 1995, xiii-xiv.

[14] al-Faruqi 1995, xiv.

[15] al-Faruqi 1995, 39.

[16] al-Faruqi 1995, 40.

[17] al-Faruqi 1995, 40.

[18] Cf. al-Faruqi 1995, 42.

is the concept of *tawhid*, the unity and unicity of God, recalled and recognized in the Islamic declaration of faith. al-Faruqi refers to the recognition of God as the 'highest rationality'.[19] For al-Faruqi, the acknowledgement of *tawhid* is the opposite of scepticism and thus the antidote thereto, [20] so that its renewed full comprehension is the starting point for the healing of the *ummah*'s diseases. According to al-Faruqi, recognizing that God is the one and only source of all phenomena corresponds to knowing that they are regular and universal; this, al-Faruqi states, is a prescription of 'optimism' on an epistemological level. In other words, for al-Faruqi, recognizing that God is One and the Creator of nature from which humans derive their knowledge, motivates and guides the investigation of nature[21] insofar as it is acknowledged that the world (described as 'cosmos' as opposed to 'chaos'[22]) belongs to Him and that therefore in nature, or 'God's manor', only reliable, orderly, meaningful and fully graspable patterns can be detected;[23] correspondingly, the perception and investigation of the natural world is liberated from superstition conveyed as the belief in multiple divine agencies or in blind forces.[24] al-Faruqi even states that 'God is the *necessary* condition of natural science'.[25] In addition to this, according to al-Faruqi, the acknowledgement of the fact that nature is entrusted to humans inspires a responsible exploitation of its resources.[26]

According to al-Faruqi, an essential step on the way to the unification, rejuvenation and reinforcement of the *ummah* was the Islamization of knowledge. In other words, the different sciences or disciplines had to be reformed according to genuine Islamic principles, and they had to be developed and diffused by a net of committed Muslim scholars supported by special grants, in the framework of an articulated cooperation between academic and political institutions.[27] al-Faruqi, who retained a strong practical inclination, founded the IIIT (International Institute of Islamic Thought) in 1981 in the suburbs of Washington, DC[28] and, with his collaborators, he devised plans and discussed them at various conferences held in Muslim countries[29] aimed both at defining in detail the different methodological aspects of the Islamization of knowledge as well as the means of its diffusion and implementation by IIIT and affiliated or analogous institutions. The Institute's current mission statement, according to its website, is as follows:

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19 al-Faruqi 1995, 71.

20 Cf. al-Faruqi 1995, 42.

21 Cf. al-Faruqi 1995, 45–46.

22 Cf. al-Faruqi 1995, 12 and 55.

23 al-Faruqi 1995, 49–59.

24 Cf. al-Faruqi 1995, 52.

25 al-Faruqi 1995, 53, emphasis added.

26 Cf. al-Faruqi 1995, 57–59.

27 Cf. AbuSulayman 1989, 57–79.

28 The town of Herndon where IIIT is located is actually in the State of Virginia.

29 See for instance the contributions (including al-Faruqi's own) contained in the *Proceedings and Selected Papers of* [the] *Second Conference on* [the] *Islamization of Knowledge 1402 AH / 1982 AC* (Various Authors, 1988) and the different agendas contained in AbuSulayman 1989.

> *'(...) the revival and reform of Islamic thought and its methodology in order to enable the Ummah to deal effectively with present challenges, and contribute to the progress of human civilization in ways that will give it a meaning and a direction derived from divine guidance. The realization of such a position will help the Ummah regain its intellectual and cultural identity and re-affirm its presence as a dynamic civilization.*[30]

After almost three decades since his violent death under mysterious circumstances, it can be safely stated that such statements still faithfully express and summarize al-Faruqi's vision. The idea of Islamizing knowledge (and science) proved extremely appealing and numerous Muslim educational institutions following the spirit, if not to the letter, of al-Faruqi's manifestos and agendas began for instance to combine the study of Islam alongside natural sciences in their curricula. [31]

Similarly to al-Faruqi, the Persian-American scholar S. H. Nasr stands out for his prolificness as well as for his academic achievements. Nasr, who came from an Iranian family of physicians and religious scholars, was sent to the U.S. at an early age; there he was the first Iranian undergraduate to be admitted to MIT, where he earned a degree in physics. Nasr was greatly influenced by the Italian-US philosopher Giorgio di Santillana (1902–1974) and, without abandoning the study of physics, started to have serious doubts about its capacity to understand reality, and so undertook extensive studies in the humanities. After graduation at MIT he obtained a Master's degree in geology and geophysics at Harvard University, where he went on to earn a PhD degree in the history of science and learning in 1958. Upon his return to Iran, Nasr became professor of history of science and philosophy at Tehran University, and later the founder and president of the Imperial Iranian Academy of Philosophy. After the events of 1979 he moved to the U.S.; he first held a position as professor at Temple University in Philadelphia and later at the George Washington University in Washington, DC.[32]

Nasr is deeply influenced by Sufi mysticism and by authors known as 'perennialist' or 'traditionalist', such as the British-Sinhalese Ananda Kentish Coomaraswamy (1877–1947), the French Louis Massignon (1883–1962), René Guénon (1886–1951), Henry Corbin (1903–1978), as well as the Swiss-German Frithjof Schuon (1907–1998) and Titus Burckhardt (1908–1984), who in various but analogous ways developed an understanding of religions from a religious point of view.[33] Here we can try to grasp the core doctrines of

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[30] http://www.iiit.org/AboutUs/AboutIIIT/tabid/66/Default.aspx.

[31] For an example of a recent proposal see 'Applied and Engineering Sciences in the Perspectives of Tawhid and Shariah' in Bakar 2008, 257–266. Abaza 2002 is a thorough analysis of analogous debates in Malaysia and Egypt.

[32] See Stenberg 1996a, 97–98; Abaza 2002, 107–108.

[33] An insuperable scholarly study of Traditionalism/Perennialism is Mark Sedgwick's *Against the Modern World. Traditionalism and the Secret Intellectual History of the Twentieth Century* (Sedgwick 2004), to which the reader curious about such a movement is referred. Sedgwick's monograph contains a detailed biographical account of Nasr (Sedgwick 2004, 153–159). The representatives of Traditionalism/Perennialism were mainly cosmopolitan intellectuals with culturally mixed backgrounds; in my short list of names I have attempted a cautious usage of adjectives of nationality. However, the reader is once more referred to Sedgwick for a detailed reconstruction.

Traditionalism/Perennialism through a brief reconstruction of Nasr's thought that in its turn is essentially in accordance with the tenets of such a movement. The entire philosophical reflection about science developed by Nasr can be seen as revolving around a pivotal contraposition: what Nasr defines as *sacred science* (*scientia sacra*), a superior form of knowledge, and the limitations or faults of modern natural science considered both in its theoretical presuppositions and in its implementation. Human beings, according to Nasr, are endowed with a 'supernaturally natural function', which he calls 'intelligence' or 'intellect';[34] by way of intellect it is possible to know the Absolute.[35] Knowing the Absolute entails knowing the existence of superior spiritual levels, comprehending the interrelatedness of the phenomena of nature, and the derivation of everything from the Absolute. According to Nasr, the awareness of the importance of intellection has been lost together with awareness of the Absolute itself. In Nasr's reconstruction, the oblivion of the Absolute characterizes the whole course of human thought that he sees as marked (in its dominant manifestations) by a continuous and detrimental de-sacralization of knowledge. We can here mention at least three important historical stages of such de-sacralization as Nasr describes it: according to him, in ancient Greece, philosophical schools based on rationalism and scepticism '(...) reduced knowledge to either ratiocination or simple mental acrobatics';[36] Renaissance thinkers favoured a concept of nature as independent and self-creative;[37] finally, Descartes reduced knowledge to individual reason and definitely divorced mind and matter. Descartes indeed, as stated by Nasr, identified nature with the physical world and the study of the latter with the study of its mathematical order.[38] In Nasr's interpretation, the contemporary sciences of nature are characterized by the oblivion of intellect and are thus severed from divinity and highly compartmentalized; a wrong usage of science's products, that is technology, brings about the environmental crisis that characterizes modern times.[39] Therefore, what '(...) parades as human progress', states Nasr, is in fact a 'mass suicide'.[40] Modern Western science, according to Nasr, has '(...) a demonic aspect to it which destroys much of the spiritual ambience, both inward and outward, of the human being'.[41]

Nasr holds that contemporary cosmology is purely physical and consequently is not to be taken seriously. Nasr regards the plurality and changes of cosmological theories as a sign of weakness of cosmology itself.[42] Furthermore, Nasr is especially critical of the theory of evolution, which he describes as the 'tent-peg of modernism (...) kept as an ideology' and aimed at reducing man to matter while excluding divinity and teleology from nature.[43] Nasr argues that it

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[34] Nasr 1981, 5.

[35] Nasr 1981, 2.

[36] Nasr 1981, 34.

[37] Nasr 1996, 100–113

[38] Cf. Nasr 1981, 41 and Nasr 1996, 102–103.

[39] Cf. Nasr and Iqbal 2007, 119–148.

[40] Nasr and Iqbal 2007, 203.

[41] Nasr and Iqbal 2007, 55; cf. also 76.

[42] Cf. Nasr and Iqbal 2007, 85.

[43] Cf. Nasr 1993, 156

'(...) requires more faith than is claimed by any religion for its founder or even for God'.[44] He regards an attempt at reconciling evolution with religious concepts such as the French Jesuit Pierre Teilhard de Chardin's (1881–1955) effort as a 'surrender' of theology '(...) to the microscope' and 'an idolatry'.[45]

In Nasr's view, rediscovering the Absolute entails curing the 'spiritual malaise' of the West including the solution for the environmental crisis. [46] Nasr's life-long scholarship is characterized by the constant attempt to illuminate all the doctrines that contributed, despite mainstream thought, to stimulate the consciousness of the sacred over the centuries, in accordance to a teaching for which Nasr employs the expression *philosophia perennis*. Thus, reading Nasr's works is like reading a counter-history of thought that, in keeping with the principles of Perennialism, is aimed at highlighting the continuity of *philosophia perennis* within (or despite) more successful doctrines. More properly it is world religions that, in Nasr's interpretation, constitute a repository of such awareness, substantiated by successive revelations. Among all religions, according to Nasr, Islam enjoys a special status. In order to argue this point, Nasr emphasizes that Islam is '(...) the last of the major religions of the present cycle of humanity'[47] that confirms and seals the previous revelations. He further stresses the importance of *tawhid*: Islam can help to rediscover '(...) the plenary doctrine of the nature of God as reality' because of the doctrine of divine unity.[48] Nasr equates *tawhid* to 'oneness', 'making one', and 'integration';[49] the Islamic testimony of faith 'there is no divinity but the Divine' (as Nasr translates it) is interpreted as 'a statement concerning knowledge, not sentiments or the will'[50] and he describes it with an emphatic point: 'It contains the quintessence of metaphysical knowledge concerning the Principle and its manifestation.'[51]

Nasr points out that mainstream Christian thought, in order to differentiate itself from the 'cosmolatry' that characterized the Greek doctrines it competed with, '(...) drew an excessively tight boundary between the supernatural and the natural, leading to an impoverished view of nature'.[52] This is strongly contrasted with Islam. Islamic education, Nasr emphasizes, revolves around the Qur'an, which contains the roots of all knowledge.[53] In Islam, according to Nasr, '(...) knowledge was never divorced from the sacred'.[54] 'The Qur'an,' Nasr holds, 'addresses the whole of the cosmos' and '(...) does not draw a clear demarcation between the natural and the supernatural'.[55] Islam, Nasr maintains, is rational,

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[44] Nasr and Iqbal 2007, 167 and cf. the entire Ch. 6

[45] Nasr 1981, 240–241.

[46] Cf. Nasr 1993, 145.

[47] Nasr 1993, 103.

[48] Nasr 1993, 12.

[49] Nasr 2010, 246.

[50] Nasr 1981, 11.

[51] Nasr 1981, 11.

[52] Nasr 1981, 35.

[53] Nasr 2010, 130–131.

[54] Nasr 2010, 131.

[55] Nasr 1993, 130.

aware of the sacred value of nature, and concerned with humans without being 'rationalistic', 'naturalistic', or 'humanistic' in the negative sense Nasr assigns to such terms. According to his interpretation, they namely denote visions of the world that are, respectively, too centred on reason, nature and man to the detriment of the divine.[56] Nasr, unlike al-Faruqi, does not elaborate a detailed plan for an Islamization of knowledge or science; however, he does speak of an *Islamic science* contrasted with Western science. He namely distinguishes the possibility of integrating the Western sciences '(...) into an Islamic perspective'[57] which should first and foremost correct the destructive impact of technology. For instance, humans are reminded that they do not own the Earth but that it has been entrusted to them by divinity, according to the doctrine of *khilafa* or vice-regency over the Earth.[58] To complete this short reconstruction of Nasr's thought it is also vital to mention that, in his interpretation of *tawhid*, examining other world religions through the lenses of Islam brings recognition to the doctrine of unity and unicity of God that likewise lies in their hearts.[59] Nasr underlines that it was by virtue of recognition of their common source that Muslim thinkers could engage in a debate with the philosophers and theologians of Judaism and Christianity.[60]

The British-Pakistani Z. Sardar equally stands out by virtue of his prolificacy and his success as a public intellectual. Sardar came to England at an early age and he earned a degree in physics and information science at City University in London. He later worked as an information consultant at the Hajj Research Center at King Abdul Aziz in Jeddah; after a five-year stay, Sardar went on to become a full-time journalist and writer. Among his numerous achievements and activities, we can here at least recall that Sardar was a correspondent for the science magazines *Nature* and *New Scientist*, that he was among the founders and the editor of the Muslim reformist magazine *Inquiry*, that he served as an advisor to the Deputy Prime Minister of Malaysia, and that he has worked extensively as a broadcaster for different British TV channels with programmes about Islam. [61]

Sardar's work and ideas are probably less likely to be satisfactorily reconstructed in a short space. At the time of his investigation, Stenberg primarily focused upon Sardar as the main figure within the *Ijmalis*,[62] a rather

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[56] Nasr 1993, 137.

[57] Nasr and Iqbal 2007, 79.

[58] Nasr 1993, 129–145; Nasr and Iqbal 2007, 98.

[59] 'Islam sees the doctrine of unity (*al-tawhid*) not only as the essence of its own message but also as the heart of every religion. Revelation for Islam means the assertion of *al-tawhid* and all religions are seen as so many repetitions in different climes and languages of the doctrine of unity. Moreover, whenever the doctrine of unity is to be found, it is considered to be of divine origin. Therefore, Muslims did not distinguish between religion and paganism but between those who accepted unity and those who denied or ignored it' (Nasr 1981, 71).

[60] Nasr 2010, 138.

[61] See Stenberg 1996a, 41–48. Sardar's *Desperately Seeking Paradise* (Sardar 2004) is a brilliant literary account of his travels, enterprises and achievements.

[62] I adopt here the spelling that Sardar himself favours in his works.

heterogeneous intellectual circle.[63] Their name is actually an original coinage from a root that we find in the adjective *jamil* 'beautiful' that according to Sardar himself evokes 'beauty' and 'wholeness'.[64] Individual differences, conceptual shifts over time and internal debates render Sardar's and *Iimalis*' ideas rather difficult to summarize. Sardar states:

> *'The Ijmalis emphasized ethical aspects of Islam and insisted on using Islamic concepts to dissect contemporary problems. While we were a heterogeneous group, with different disciplinary backgrounds, we were united by methodology of conceptual analysis that we learned together and we hammered out in all-night sessions. Rather than "Islamize" already existing disciplines, we argued for new discourses, rooted in Islamic concepts, through which the external expression of Muslim civilization – science and technology, politics and international relations, social structures and economic activity, rural and urban development – can be studied and developed in relation to contemporary needs and reality.'*[65]

It can be stated that *Ijimalis* considered science as both socially constructed and instrumental, that is, as an activity first and foremost oriented to the solution of practical problems. On the one hand, the *ijimalis* were concerned with the state of Muslim societies, which they saw as lagging behind in the acquisition, practice and development of science. On the other hand, they also regarded Western science as destructive and in a state of crisis.[66] In order to understand Sardar and the *Ijimalis*' comprehension of science in greater detail it is necessary to emphasize analogies and contrasts with other interpretations of it. They did not believe in positivistic, value-free science, pointing out that perceptions depend on non-empirical, subjective categories; they rejected extreme relativism since they advocated that subjectivism is objective or, in other words, that relativism can be kept in check by consensus; they also rejected the Marxist view of science that enlightened its ideological side and the power struggles in which science is embedded, since they considered it limited to the analysis of class positions and therefore too weak to grasp the complexity of science itself; finally, while recognizing the value of intuition in creativity, the *Ijimalis* criticized the elitism of the mystic approach. *Ijimalis* rather stressed reconstruction, complexity and interconnection.[67] Put differently, according to Sardar and the *ijimalis*, it was necessary to render science relevant to Muslim culture while simultaneously reforming it according to Islamic principles and concepts, such as the idea of the trusteeship of nature (*khilafa*), social justice (*adl*) and public interest (*istislah*).[68] Sardar emphasized as well that in Islam the pursuit of knowledge (*'ilm*) is a form

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[63] Stenberg lists among them at least the journalist and anthropologist Merryl Wyn Davies (b. 1948), the Pakistani-Swedish geologist S. Parvez Manzoor, and the biologist Munawar Ahmed Anees (cf. Stenberg 1996a, 48–50); cf. Sardar's own reconstruction in Sardar 2004, 207–208.

[64] Cf. Sardar 1989a, 112 and Sardar 2004, 208.

[65] Sardar 2004, 209.

[66] Sardar described contemporary science with the image of the 'touch of Midas' whose '(...) ability to do a great good for mankind now seems to be overshadowed by its even greater capacity to do evil' (Sardar 1984, 1).

[67] Cf. Sardar 1989a, 156–161.

[68] Cf. Sardar 1984, 1–12 and Sardar 2004, 209–210.

of worship (*ibadah*) and that the principle of *tawhid* interconnects mankind and nature, the different forms of knowledge as well as knowledge and values.[69]

One might at this point sense some analogies with the positions of al-Faruqi and Nasr. In fact, Sardar was vehemently opposed to their ideas, and his position can be further grasped through the critique he articulated against al-Faruqi's Islamization and Nasr's perennialism. Sardar regarded al-Faruqi's plans as the unrealistic infusion of Islamic principles in disciplines already imbibed with materialistic metaphysics, and therefore as a 'cosmetic epistemological face-lift' it would at best preserve the dichotomy of secular and Islamic science that it professed to oppose. In other words, what al-Faruqi could not see, according to Sardar, was that the subdivision itself of the disciplines that the U.S.-Palestinian thinker wanted to reform was embedded in a Western worldview. Muslims, according to Sardar did not need to Islamize disciplines, but rather to develop their own ones, rooted in their own culture and aimed at the solution of their own problems. [70] As to Nasr, I have already hinted at the *Ijimalis*' criticism of mystical elitism; furthermore Sardar described the U.S.-Persian author's scholarship as a confused mixture that presented Greek Gnosticism (mysticism) in Islamic terminology, built up on unclear or unsound metaphysical principles and plagued by numerous omissions or factual errors concerning historical references. [71]

Finally, we must recall that Sardar also rejected Bucaille and Bucailleism; in his opinion, it was 'apologia of the worst type'[72] and more specifically Bucaille's first book was '(...) essential reading for Muslims with a larger-than-life inferiority complex';[73] Sardar followed several, albeit complementary, lines of

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[69] Cf. Sardar 1984, 7 and 2004, 209. In Sardar 1989a (163–164) we find a complex 'working definition' of the *Ijimalis*' Islamic science:

'Islamic science is a subjectively objective enterprise: it is based on a circumspect rationality which connects human rationality to the conceptual matrix of Islam and hence synthesizes pure knowledge with moral knowledge. The subjectivity of Islamic science is itself objective, since it is based on such Islamic conceptual categories as *khilafah*, *adl*, *halal*, *haram*, *istislah*, *taqwa* and numerous other concepts of the Quran and Shariah – in which it has its epistemological being – and on a social consensus, the *ijma*, of the Muslim community and civilization, the *ummah*. It uses methods in conformity with the questions it raises, the problems it seeks to solve, the needs it wishes to fulfil. It is universal not just because Islam itself is universal, but because it is grounded in a rationality and a methodology, empirical and experimental work that is objective and can be duplicated and repeated by people of all cultures. Its nature and contents reflect its metaphysical and epistemological foundations, as well as the needs, requirements and concerns of Muslim people. It seeks not to discover absolute truths but to delineate their exposition and highlight the complex and interconnected nature of reality – thus, it is ultimately a form of worship, a *ibadah*, a way towards the glorification of God and elevation of man, as well as a systematic and organized way of solving the physical problems, and fulfilling the needs of individuals and society.'

[70] A vivid report of the disagreement between Sardar and al-Faruqi, which was also expressed during personal meetings, can be read in Sardar 2004, 196–203. In an unpublished interview not included in this book (Dubai, 23 June 2011), Sardar recognized that the *ijimalis*' experience was concluded, and that its main merit had been the dissemination of the critical ideas that had challenged notions of the relationship of Islam and science that were dominant at the time. For a comparison between Sardar and Nasr see Stenberg 1996b.

[71] Cf. Sardar 1989a, 114–134.

[72] Sardar 1989a, 31.

[73] Sardar 1989a, 33.

criticism directed at Bucailleism: first of all, according to him, Bucailleism relied on a positivistic vision of science as neutral, static and universal, and made the supposed demonstration of the Qur'an's divinity dependent on shaky scientific truths or facts; secondly, and conversely, it sacralized science and undermined any criticism of it; thirdly, Bucailleism often resulted in far-fetched interpretations of the lexicon of the Qur'an that went hand-in-hand with oversimplified (or simply wrong) notions presented as scientific; the Qur'an should not be treated as a database, Sardar pointed out: it provides motivation for the pursuit of knowledge, that begins with it but does not end in it .[74]

It should be clear at this point that the four authors mentioned elaborate upon Islam and science, or on 'Islamic science', in rather divergent ways. Furthermore, the expression 'Islamization' seems to apply first and foremost to al-Faruqi's ideas and work.[75] Stenberg, nevertheless, significantly extended its usage to all of the four positions investigated. He does indeed recognize that Bucaille, al-Faruqi, Nasr and Sardar held distinct views;[76] yet, Stenberg envisaged commonalities between them that he perceived as deeper than the distinctions they declared. *In nuce*, unconventional Muslim intellectuals outside the madrasah-educated clergy, who studied in Western institutions, expressed all four positions. They all perceived shortcomings, if not an overall malaise, in contemporary Western science and pointed at Islamic concepts as the cure.[77] They all agreed that science and Islam can be integrated (or rather, *must* be integrated) and that in some great intellectuals and scientists of the past, such integration found a perfect balance especially in a period defined as the Islamic 'Golden Age' (eighth to thirteenth century CE). Each of these authors strived both to establish themselves as Muslim authorities, and to redefine the role of Islam in a world deeply changed by science through technology.[78] In this sense, if one follows Stenberg's analysis, it is conceptually sound to define the science at which they aimed as 'Islamized'.[79]

I tried to interpret my first contact with the world of Islam and science from what I had learnt through Stenberg's investigation. It was clear to me that the very first narratives and ideas I had been exposed to were related to the spirit, if not to the letter, of Bucaille's works. Thus since the beginning of my own exploration I developed a specific, keen interest in this minor but extremely influential author. As I would soon learn in the course of my own readings,

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[74] Cf. Sardar 1989a, 30–37 and Sardar 1985.

[75] According to Mona Abaza, the expression 'Islamization of knowledge' was first devised at a conference in Mecca in 1977 (Abaza 2002, 9).

[76] We can however recall very occasional collaboration among some of them. For instance, Nasr has contributed with an essay to Sardar 1989b. al-Faruqi makes an appearance in *The Book of Signs*, a film (Sharom M. Dom, Malaysia, 1986) dedicated to Bucaille's theses.

[77] Even Bucaille (in a private letter to Stenberg, 15 January 1995) expressed concerns for 'blameworthy practices' such as genomic modification and seemed to auspicate that scientific research and implementation of scientific results be guided according to religious teachings.

[78] For a reconstruction of the way in which the new media have contributed to substantial changes in the Muslim intellectual landscape, and a description of the 'new intellectuals' of Islam consistent with Stenberg's analysis, see Eickelman and Piscatori 2004; 4–45.

[79] Cf. Stenberg 1996a, 269–337. From the point of view of Stenberg, it might be equally sound to speak of their theories as aimed at a 'scientification of Islam'.

investigations on Bucaille and his ideas at the time of their publication were far from original. The French physician reflected a pre-existing tradition of 'scientific interpretation', or *tafsir 'ilmiy* of the Qur'an, most probably originating in the last two decades of the nineteenth century and aimed at reading the text in the light of contemporary scientific notions. Such a trend in the course of time would more specifically develop into the search for the 'scientific miracles' of the Qur'an, or *I'jaz 'ilmiy*; the search, in other words, for specific scientific concepts or even the anticipation of human inventions in the sacred text, that was often carried out by authors with a scientific or technical education.[80] We have already considered the key argumentation of this kind of research: such notions could not have been known to an illiterate Prophet if they were not even mastered by the most learned persons of his time, and clearly their presence in the Qur'an proved the text's divine origin. The miraculousness of the Qur'an was no longer to be envisaged solely in its linguistic beauty and inimitability, but rather in its 'scientific content'. In Bucaille's work, especially impressive since its author was perceived with the aura of a Western convert and the traditional prestige of a physician who boasted illustrious patients, peaked a conceptual shift in the study of the Qur'an and one that was initiated much earlier.

My philosophical sense for consistency was neither satisfied by the fact that Bucaille claimed to read the Bible and the Qur'an with a scientific mind while seeming to hastily take supernatural narratives for granted, nor by his naïve distinction of 'theories' and 'facts'.[81] However, I also thought that allegations, often to be found in the Internet, according to which Bucaille was insincere and expressly paid by Saudi Arabia to produce his very first work, were somewhat ungenerous and probably unfounded. One major point that raised my curiosity was Bucaille's religiosity: whereas he is definitely perceived as a convert by his sympathisers, I found no evidence in his texts in the form of a direct statement that he actually was. Moreover, Bucaille seemed to constantly present his discussions as based on his own findings. Therefore, I was also curious about Bucaille's own 'library' and network: if he had given visibility to a pre-existing trend, which authors might have specifically influenced him? My investigations, which led me to smuggle myself into the small cemetery of Bucaille's native village in Northern France as well as to question people in the neighbourhood about his practice in Paris,[82] did not shed any light on this matter and, as far as I am concerned, the location of Bucaille's grave together with the question of his actual conversion remain a mystery.[83]

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[80] See Jansen 1974, 35–54, Wielandt 2002, Rippin 2005, 238–241, and Dallal 2010, 169–173. Sardar 1989a mentions and criticizes other Bucailleists (30–37) and identifies Qur'anic contemporary numerology as a third extreme aspect of Qur'anic exegesis in the light of science (37–42). In 2010 this trend had even reached the pages of the *International Journal of Cardiology* (cf. Loukas *et al.* 2010).

[81] See Bigliardi 2011.

[82] This could be found thanks to the letterhead of two typed letters from Bucaille in the possession of Leif Stenberg (15 January 1995 and 27 January 1995). I exchanged some words with a friendly concierge who fondly remembered Bucaille as '*un homme très intelligent*'.

[83] In the small cemetery of Pont-l'Évêque (Calvados) I could only locate a grave in which, according to the tombstone, three people were buried: Mme Bucaille née Destin (1854–1926), Mr Maurice Bucaille (1883–1937), Mme Maurice Bucaille (1889–1975 – 'Maurice' was indeed also a female

Maurice Bucaille wrote like a positivist but he was romantically fascinated by Egypt. I must admit that, whereas I could well perceive the *naiveté* of his works, I could not help feeling some sympathy for this fortunate *dilettante* who, after all, could be admired for his decision to take up the study of Arabic at a rather mature age while embarking on a completely different intellectual enterprise from his ascent in the French province to a successful career as a physician in Paris. When I finally closed my personal 'Bucaille files' I decided to assume a benevolent stance. His insistence on qualifying himself as a medical doctor could be seen as a trait of provincial, old-fashioned pride, but also as a sign of modesty while he was taking up non-medical topics. His conversion might have been kept implicit rather than emphatically expressed as a potential source of trouble in his cultural and professional *milieu*. His annoyed reactions to critical questions might have been a sign of his lack of familiarity with academic debating techniques rather than a sign of inflexibility. Moreover, his success might have surprised and overwhelmed him rather than been foreseen or even planned by him or by a client.[84]

Back at the libraries, my explorations made me stumble upon two works that run contrary to the spirit of the authors whose ideas I have so far recalled. Two physicists, the Pakistani Pervez Hoodbhoy (b. 1950) and the Turkish-US Taner Edis (b. 1967), have attempted a systematic refutation of the harmonic relationship of Islam and science: Hoodbhoy with *Islam and Science: Religious Orthodoxy and the Battle for Rationality* (1991), Edis with *An Illusion of Harmony. Science and Religion in Islam* (2007). Hoodbhoy's and Edis' works apparently differ in their conceptions of Islam (and religion in general) and its relationship with science. Hoodbhoy separates the dominions of science and religion, the latter being 'a reasoned and reasonable abdication of reason with regard to those questions which lie outside the reach of science'.[85] Hence, in Hoodbhoy's view, religion and atheism are equally compatible with science, and no direct attack is made on the religion itself.[86] Edis instead embraces philosophical naturalism,

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name), next to another anonymous grave. Later, I was not able to locate Dr Bucaille's grave in any of the major cemeteries in Paris. Finally, (at the cost of giving the impression of scholarly paranoia concerning minor issues), it should be pointed out that I have not found any obituary in French newspapers online. The year of Bucaille's death is only reported on websites that seem to mirror or replicate each other's information. I have been corresponding as well with the Société française d'égyptologie (of which Bucaille is said to have been a member since his youth) but no information regarding him was found in the electronic or hard-copy archives. Reached on the phone, Mme Bucaille declined to answer any questions about her late husband's intellectual and professional vicissitudes. Similary, Maurice Bucaille had declined to set up a meeting with Leif Stenberg in the 1990s.

84 See Bigliardi 2012. Bucaille's works still enjoy immense popularity and are available in numerous editions and reprints. As late as 2012, while walking down Yonge Street in Toronto, I came across a stand of information about Islam. I declared my interest in the matter of whether Islam and science are compatible. A young man in a traditional vest replied: 'If you are interested in that then there is a book by a French doctor...'. I could hardly conceal a smile.

85 Hoodbhoy 1991, 136–138.

86 Hoodbhoy is inspired by the views of the Pakistani Mohammed Abdus Salam (1926–1996). Salam, Nobel laureate in physics in 1979, was both a devout Muslim and an advocate of the universality and neutrality of science (which, in turn, ensures its harmony with religious beliefs, but of course of a deeply different kind than that advocated by the 'Islamizators'). Indeed, Salam has written a supportive foreword to Hoodbhoy 1991 (ix-xii). Stenberg mentions Salam as opposed to

according to which referring to the results of modern physics and biology can better attain an explanation of the world, and on such basis he disposes of notions such as God or the immortality of the soul.[87] Hence, in Edis' overall work, the harmony of Islam and science is only one specific critical target in a more general refutation of religion.

That being said, Hoodbhoy's and Edis' criticisms display strong similarities. Both authors are concerned with the status of science in Muslim societies, a theme that remains in the background of their work. Furthermore, neither of the two wants to present himself as a wholehearted advocate of the Western approach to science. Hoodbhoy warns against the risk of confusing modernization with Westernization and emphasizes that the material success of a religion is not a sign for or against its truth.[88] Edis states that '(...) in the scientifically advanced West we have our own illusions of harmony, our own myths that help us strike a balance'.[89] It should also be remarked that Edis advocates the necessity of a well-informed and balanced, if critical, approach to Muslim discourses.[90]

However, Hoodbhoy's and Edis' works stand out as I have beforehand mentioned, as systematic criticisms of all those approaches to Islam and science that have been reconstructed by Stenberg, and they display strong similarities in their lines of attack. Both authors ridicule the exegetical trend embraced and rendered famous by Bucaille, arguing that Bucailleism produced a massive body of ludicrous texts that rely on (and encourage) scientific incompetence. In Edis' words, science, in Bucailleism, is reduced to a 'stamp collection'.[91] Both Hoodbhoy and Edis see the attempts at recasting or reforming science according to Islamic principles as unfeasible because the principles themselves are too vague or non-scientific.[92] Both authors also question the solidity of the historical argument in favour of the harmony of Islam and science. The status of science, the intellectuals' social conditions during the Golden Age of Islam are scrutinized, as well as the individual ideas and vicissitudes of some specific thinkers which are usually presented as the champions of that age, such as Avicenna (Ibn Sina, 980–1037 CE) or Averroes (Ibn Rushd, 1126–1198 CE). Both authors conclude that Islam cannot be said to have been a decisive factor in the intellectual development of those particular thinkers (who were outstanding but also held views out of tune with their contemporaries' views), especially because the science of the past bears little resemblance to that of present day. In

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the authors he investigates without treating his ideas at length, because of the scant number of his publications (cf. Stenberg 1996a, 21). It is here worth mentioning that Salam stressed three 'fundamental premises' for the reflection on Islam and science: first, the Qur'an's emphasis on natural phenomena and their observation; second the absence of contradictions between the Qur'an and science ('eloquently reinforced by Maurice Bucaille'), and third, the absence in Islamic history of a case like that of Galilei (Salam 1987, 179–180).

87 This emerges clearly from Edis 2002 and Edis 2008.

88 Cf. Hoodbhoy 1991, 138.

89 Edis 2007, 251.

90 Cf. Edis 2006.

91 Edis 2007, 101.

92 Cf. Hoodbhoy 1991, 65–85; Edis 2007, 165–188 and 205–209.

this sense, the historical dimension of the discourse on the harmony of Islam and science is deconstructed and rejected as the ideological exploitation of a fictional past.[93]

The reconstruction by Stenberg and the criticism by Hoodbhoy and Edis[94] provided me with an initial framework in which I could place and coordinate the various, scattered fragments of the debate on Islam and science that I had encountered in Alexandria and in my first non-systematic explorations of libraries and the Internet. Awareness of Bucaille's work and of its place within Muslim cultures had been enlightening: I finally understood the context and origin of Dr Saber's statement according to which NASA discoveries had proved a Qur'anic miracle. However, I did not feel satisfied. More and more questions kept coming to my mind. Does the 'scientific exegesis' or 'scientific miracle' of the Qur'an and the highly intellectual plans for Islamic reformations of science exhaust the debate on Islam and science? Are there any new voices? What is the impact on the present-day debate of older theories and of the systematic confutations thereof? What is the background of the new authors? What are their stances towards others engaged in this debate? The present book is my response to the desire of answering such questions.

I identified a select number of Muslim authors notable for their recent publications and media interventions on Islam and science. After assimilating their works, I embarked on a series of travels to different countries in the Middle East, where I have conducted interviews with them in order to reconstruct, in a highly readable form, their main ideas on Islam and science as well as their positions on specific sensitive issues taken up by past and present colleagues and adversaries.[95] Two of them mainly, but not solely, continue the tradition of Bucailleism: they namely focus on the 'scientific miracles' of the Qur'an and take a polemical stance against Darwinian evolution; they are the Turkish religious leader and author Adnan Oktar (b. 1956), who writes under the pen name of Harun Yahya, and the Egyptian geologist Zaghloul El-Naggar (b. 1933). The remaining authors are the Iranian physicist Mehdi Golshani (b. 1939), the Iraqi

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[93] Cf. Hoodbhoy 1991, 93–117 and 85–108; Edis 2007, 33–52.

[94] It is to be remarked that, historically, the most virulent criticism levelled at the compatibility of Islam and science was due to the French historian Ernest Renan (1823–1892), who in a lecture at La Sorbonne (1883) observed that: 'All who have been to the Orient or to Africa are struck by what is the inevitably narrow-mindedness of a true believer (…) absolutely closed to science, incapable of learning anything or of opening itself up to any new idea' (Renan 2011, 2). *In nuce*, Renan believed the presence of science in the Muslim world during the so-called Golden Age was due to Greek influence (the Arabs/Muslims being just blind or passive transmitters thereof), or to the 'Shiite' genius of Persia (that Renan indeed distinguished from Islam proper, cf. Renan 2011, 3). Science, in Renan's reconstruction, had survived '(…) despite Islam, against Islam', and he added: 'To honour the Islam of Avicenna, Avenzoar, Averroes, is like honouring the Catholicism of Galileo. Theology hampered Galileo; it was not strong enough to stop him; this is not a reason to be grateful to it' (Renan 2011, 9). For a short refutation of the supposed incompatibility of medieval Muslim culture with science (referring to criticisms similar to Renan's) see Haq 2009.

[95] The idea of the conversations about science and religion is not original at all; such a form is adopted for instance in Richardson and Slack 2001, and in Paulson 2010. I have tried to improve the approach adopted by such works, (that involved some of my interlocutors as well), by keeping the conversations' focus on the debate over Islam and science, in a net of interrelated references to specific sub-debates, as well as by presenting and discussing them in my own critical frame.

physicist Mohammed Basil Altaie (b. 1952), the French astrophysicist Bruno Guiderdoni (b. 1958) and the Algerian astrophysicist Nidhal Guessoum (b. 1960).

With the exception of Harun Yahya whose work and encounter required (for reasons that will soon be clear to my reader) a somewhat different approach, a brief description will be provided for each of my interlocutors while more specific biographic details emerge in the course of the interviews themselves. The interviews are innervated by the overarching questions, which initially interested me, but they include other questions that emerged while reading each of the authors' work and were therefore tailored to specific issues. I have explicitly asked my interlocutors to expand on various specific issues such as quantum physics and biological evolution that constitute, as we will see, points of reflection and controversy in the discussion on Islam and science, which takes place within the wider framework of the debate on *religion* and science. I used Stenberg's work, as well as the critiques elaborated by Hoodbhoy and Edis, as maps. In other words, whereas specific questions vary according to the individual author's interests, the general framework remains the same for each interview. Most of the queries were planned – for example I chose to explicitly ask each and every author about his knowledge of and stance towards the others' work. Other questions arose spontaneously. As I have beforehand mentioned, what was planned as a conversation with Harun Yahya turned instead into a peculiar, and relatively short exchange of questions and answers. However, given Yahya's massive media presence and his relevance for the contemporary debate about Islam and science, I have decided to include our encounter in the present work by complementing it with a longer analysis and interpretation of his message. Given such divergences, it is my conviction that all the conversations have proved highly significant.

Occasionally, the conversations ended up touching upon political issues. In some specific cases I did not feel at ease with the opinions expressed and still I decided not to counter them since I preferred to stimulate discussion of other topics. Needless to say, reporting some opinions or not having criticized them right after their statement on part of one of my interlocutors does not imply that I share them. However, I have decided to preserve such parts of the discussion so as to share them with my reader for documentary reasons. It is indeed my conviction that even such stances equally help to reconstruct my interlocutors' respective intellectual profiles as well as to give my reader an idea of the numerous conceptual entanglements of the debate on Islam and science proper.

In my exchange with the six interlocutors, some topics such as afterlife, resurrection and bioethics have intentionally been left marginal. I concentrate instead on my personal, initial entry point into this debate: the notion of 'miracle'. The guiding intuition behind this insistence is the following: since miracles tend to be conceptualized in terms of natural *versus* supernatural, literal *versus* metaphorical, ordinary *versus* extraordinary, asking an author to specify his thinking about miracles provides an access to his conception of reality and its levels, as well as the knowledge of reality itself and the laws governing it, and of his exegetical principles when it comes to specific Qur'anic narratives. In other words, I have not decided to discuss the concept of miracle merely to satisfy the naïve curiosity of whether a scientist believes in them or not; rather, I use them as

a point of access into each author's approach to scientific and religious belief and their mode of Qur'anic interpretation.[96]

Regarding the matter of miracles, some introductory remarks should be added for any reader who might not be familiar with the Qur'an. *Stricto sensu*, as I have already hinted at while discussing Bucaille's mode of exegesis, the Qur'an itself as the descent of a revelation conforming to a heavenly archetype is 'the' miracle of Islam, with its amazing uniqueness and inimitability being ultimate proof of its divine origin. This meaning is nevertheless not the only one. Firstly, Qur'anic passages have been interpreted as relating to deeds or episodes of the Prophet whose character might be judged, by modern standards, supernatural or miraculous; for instance, when a spider conceals the Prophet and his fellow Abu Bakr by weaving its net at the entrance of a cavern where they have taken refuge (Q 9: 40); the Prophet's instantaneous journey to Jerusalem overnight (Q 17:1); the Moon dividing into two parts (Q 54:1); and when two angels open the young Prophet's breast, take out the heart, purify it with snow, then replace it (Q 94:1).[97] Secondly, the Qur'an refers to the supernatural deeds concerning Prophets that we encounter in the Old Testament as well: for instance when Abraham cannot speak after being told of his wife's late pregnancy (Q 3: 41); when Moses performs his prodigies in front of the Pharaoh and the Hebrews (Q 7: 106–108, 133; Q 20: 80); when Solomon commands the winds (Q 21: 81; Q 34: 12; Q 38: 36). Thirdly, the issue shows a degree of complexity in that such deeds and episodes are often defined with the term *ayah* (pl. *ayat*) 'sign'. The attribute related to *ayah*, *bayyina*, or 'clear', becomes itself a synonym of 'sign' within Qur'anic lexicon, and such terms are also used in reference to what we could define as two different classes of phenomena. The first class is constituted of natural processes and their creation; e.g. fruit ripening (Q 6: 99); the growth of plants (Q 13:4); rain (Q 16: 65); brewing (Q 16: 67); the alternation of night and day (27: 86). The second class is that of historical or past events: for instance, when a sacred she-camel is sent by God to the people of Thamud (Q 7: 73; Q 11: 64; Q 17: 59; Q 26: 154–158) or when a violent wind is raised against the Adites (Q 41: 15–16). In addition, the very term *ayah* describes the verses themselves of the Qur'an (Q 26: 2; Q 27: 1; Q 31: 2). Furthermore, we find in the Qur'an reference to deeds and episodes that display supernatural character without being directly described as *ayah*; for example when slain birds are resurrected for Abraham (Q 2: 260) or when Abraham is protected from fire (Q

[96] Much to my consolation I have found the same intuitions that guided the investigation here offered to my reader condensed in the opening lines of Graham H. Twelftree's recently appeared monograph on miracles: 'In their various ways, atheist, agnostic and believer alike *negotiate* the problem of miracle: their possibility, their apprehension and, if any, their meaning' (Twelftree 2011, 1; emphasis added).

[97] It should be remarked that this is only a possible interpretation of the verse at stake, and one generally *not* accepted by Shia, since the Prophet is considered sinless from birth. Analogous considerations hold for other narratives touched upon here, such as the opening of the Prophet's breast or His journey to Jerusalem. However, they seemed worth mentioning in a reconstruction that, rather than focusing on specific theological doctrines, tries to provide the reader with an overview of Qur'anic passages or of narratives connected to such passages, that *might* be judged by any reader, Muslim and non-Muslim alike, as supernatural. Other remarks about concepts or narratives of miracles will be given in the course of the conversations.

21: 69). It should be noted that the Qur'an also explicitly suggests de-emphasizing the importance of miracles and extraordinary events.[98] Other miraculous narratives flourished around the ascetic figures known as Sufi. The corpus of the tales relating their wondrous deeds constitutes an extremely rich literature.[99] Muslim theologians reacted to Qur'anic and extra-Qur'anic narratives, by developing, by way of comparison, extremely fine grained definitions and classifications of miracles. In particular, a further terminological and conceptual distinction was developed between *mujizaat,* miracles of the prophets, meant to confirm God's power rather than the prophets' powers (thus similar to the Greek *dynameis*) and *karamaat* (similar to the Greek *charisma*), basically denoting the favoured condition conceded by God to the saints, which implies the capacity of performing supernatural deeds as well, sometimes kept secret by the saint.[100]

The problem of the extraordinary was particularly connected with that of causation; its discussion was suggested by the Greek texts preserved, transmitted and interpreted by Arabic scholars. For instance Al-Ghazali (1058–1111 CE) defended the idea that miracles, meant as divinely operated interruptions in the usual course of nature which prove the truthfulness of a prophet, are logically possible along with a literal reading of miracle stories in the Qur'an; Averroes (-1126–1198 CE) rather defended the centrality of the miracle of the Qur'an and claimed that admitting a disruption of the order of nature is tantamount to denying the difference between certain and conjectural knowledge. However, he also admitted that miraculous stories had edifying value.[101] We will observe that all these terms, meanings, narratives and philosophical interpretations are highlighted, drawn upon and weaved together in different ways by my interlocutors.[102]

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[98] Cf. Q 6:7–10: '(7) If we had sent unto thee a written message on parchment, so that they could touch it with their hands, the unbelievers would have been sure to say "This is nothing but obvious magic!" (8) They say "Why is not an angel sent down to him?" If We did send down an angel, the matter would be settled at once, and no respite would be granted them. (9) If We had made it an angel, We should have sent him as a man, and We should certainly have caused them confusion in a matter which they have already covered with confusion. (10) Mocked were many apostles before thee; but their scoffers were hemmed in by the thing they mocked.' It should here be remarked that in the Gospel Jesus also refused to perform miracles on demand (cf. Matthew 12:38–40: 38. Then some of the Pharisees and teachers of the law said to him, 'Teacher, we want to see a sign from you'. 39 He answered, 'A wicked and adulterous generation asks for a sign! But none will be given it except the sign of the prophet Jonah. 40 For as Jonah was three days and three nights in the belly of a huge fish, so the Son of Man will be three days and three nights in the heart of the earth.' NIV).

[99] Cf. Schimmel 1975, 284–302; Gramlich 1987; Woodward 2001, 206–230.

[100] Cf. Gramlich 1987, 1618; Schimmel 1994, 187; Geoffroy 2000; Radtke 2000.

[101] Cf. Al-Ghazali, *The Incoherence of the Philosophers*, *Introduction* to the *Second Part* and *Seventeenth Discussion* (Al-Ghazali 2000, 161–178) and Averroes, *The Incoherence of the Incoherence*, 509–515 (Averroè [Averroes] 1997, 471–477). For comparative analyses cf. Kogan 1981 and Yazicioglu 2011.

[102] The reader specifically interested in the interpretation of the verse that first raised my curiosity can peruse Görke 2010. Görke analyses in great detail the theses of early modern and contemporary exegetes (including Harun Yahya and El-Naggar) and identifies eight types or trends in the interpretation of the splitting of the Moon: (1) as an historical, miraculous event aimed at authenticating the Prophet's message; (2) as an historical event occurring at the time of the Prophet albeit not aimed at authenticating His message; (3) as an historical event that occurred long before the Prophet's lifetime; (4) as a not yet occurred sign of the end of times; (5) as an already occurred

Similarly to 'miracle', some other sensitive terms have been the object of an explicit request of a definition to my interlocutors. For others that have different meanings in different contexts as well, an initial 'core meaning' has been tacitly assumed (for instance, 'science' was meant to refer to 'contemporary natural science'). However, I invite my reader to assume a nominalist attitude, that is, to let the specific definition emerge from an author's discussion rather than beginning with strict and preconceived definitions.

Some conclusive remarks on how to read the following pages: First of all, it is rather important to emphasize, especially for anyone who might be tempted to approach the debate about Islam/religion and science with feelings of scepticism and condescension, that the discussion as it is carried out by myself and by my interlocutors, even when strong opposing views as to specific topics are expressed, is constantly concerned with the scholarly or logical soundness with which specific points are argued for or against, and never with the sincerity of one's beliefs nor with the value of the harmonization of Islamic faith and scientific culture as a whole. One of the ambitions of the present work as well as of my activity as a scholar is to contribute to the demonstration that believing in Islam is far from automatically entailing a tendency to obscurantism, irrationalism and lack of intellectual depth or vivacity. Secondly, a potential objection I would like to dispose of is that I have explored within the same work the views of authors who similarly advocate the harmony of Islam and science, yet do so from backgrounds that deeply differ in scholarly depth. For instance, while these pages were being completed, a senior scholar whom I had consulted regarding Qur'anic exegesis refused to discuss Bucaille at length as an author 'beneath contempt'. I am well aware of different levels of discussion yet I also refuse to conduct my analysis from – or limit it to – an ivory tower. It is indeed my conviction that the debate over Islam and science displays a special interplay of different ideas and figures that, without being blurred together, need to be comprehensively studied; I dare hope that I have sufficiently clarified respective contexts and interactions. Finally I would like to accentuate that I have undertaken this exploration of Islam as a scholar trained in philosophy of science, and I have tried to write the kind of book that would have quenched my curiosity when I first came across the debate on Islam and science in the hope that other readers might share my interest. One might define the present work as interdisciplinary. Interdisciplinarity is one of the most fashionable academic catchwords of our time. Yet anybody who has embarked on interdisciplinary research will agree that such an approach, similarly with the virtue of honesty according to Juvenal's verse, *laudatur et alget:* it is praised but left out in the cold.[103] Touching upon issues belonging to different disciplinary fields, as I have done in compiling *Islam and the Quest for Modern Science*, a researcher is inexorably confronted with the dissatisfaction of those fields' experts. This results in practical difficulties in finding support in academic institutions. Moreover, one has to cope with a

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sign of the end of times; (6) as a metaphor (the expression 'the Moon is cleft asunder' meaning 'clear'); (7) as a symbol (the Moon signifying the Arabs); (8) and as a combination and unification of some of the preceding interpretations (cf. Görke 2010, 83–84). I am also aware of the existence of a so-far unpublished professorial thesis on the argument (Schöller 2004).

[103] Juvenal, *Satires*, I, 74.

constant, intimate dissatisfaction: the feeling of solely having scratched the surface of a relevant matter.[104] I had my share of difficulties, yet I have been lucky enough to find academic institutions to support my research. I have come to accept that my research (or any research) is open and inexhaustible in character. While working on this book I regarded myself as an explorer and a mediator. Hopefully I could convey at least an idea of the complexity and diversity of the ideas at stake. Clearly, my six interlocutors do not represent all the voices currently dealing with the sensitive issue of Islam and science, nor does each conversation exhaust an author's views on specific points. A collection of conversations is not a systematic treatise. What I am sharing are the partial results of an on-going investigation that aims at attracting the attention of academic circles as well as laypeople. The dialogues offered here as well as the introductory remarks and afterthoughts will achieve their aim if they provide their readers with a general survey of the debate, a sense of its scope and a glimpse at its complex conceptual knots and ambitious agenda. It is my hope the readers will be enticed into reading the work of these six authors and others and, ultimately, to join the debate itself either as newcomers or with their specific expertise.

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[104] The present monograph is not, primarily, historical in character. In principle, older authors are taken into account only insofar as they become relevant in the words of my interlocutors. Furthermore, the centrality that I here attribute to Stenberg's analysis, as well as to Hoodbhoy's and Edis' critiques, should not induce my reader to overlook the fact that other authors, between the nineteenth and the twentieth century, had been developing influential theories on the interrelatedness of Islam and science as a result of the impact of the Muslim society with science embodied in the technological superiority of colonial powers, or as a specific reaction to the above-mentioned attack by Ernest Renan. Among such authors we should mention at least the Indian Sir Seyyed Ahmad Khan (1817–1898), as well as al-Din Al-Afghani (1838–1897), and the Egyptians M. Abduh (1849–1905) and Rida (1865–1935), on whom focuses, for example, Furlow 1996. Other figures and movements not touched upon here include Sir Muhammad Iqbal (Sialkot, Punjab 1877 – Lahore, 1938), and the above-mentioned Said Nursî that will be dealt with only briefly. Expert readers might find other notable absences of contemporaries such as the Malaysian scholar Bin Ali Al-Attas (b. 1931), the Iranian author Ali Shariati (1933-1977), the Syrian author Muhammad Shahrur (b. 1938), the Turkish author and religious leader Fetullah Gülen (b. 1941), the Iranian thinker Abdolkarim Soroush (b. 1945) the Malaysian scholar Osman Bakar (b. 1946) who blends the ideas of Nasr and al-Faruqi (cf. Bakar 2008), and the Pakistani-Canadian Muzaffar Iqbal (b. 1954). Both expert and non-expert readers are invited to take my monograph as a first exploration of more vast discourses and debates liable to be investigated both vertically and horizontally.

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Notes on the conversations

The following texts report the conversations held with my interlocutors under the circumstances described in the introductory paragraphs to the conversations themselves. With the exception of Mr Adnan Oktar, all my interlocutors, after receiving my transcription, provided me with a first edited version of our exchange. Surpluses and other typical features of spoken language have been eliminated while strictly respecting the original diction.

Whereas my interlocutors had provided me with different transcriptions of Arabic words and names (for instance: *hadeeth*, *Hadith*) I have adopted a homogeneous (albeit simplified) transcription system, and namely the one adopted in the text of the *History of Islamic Theology – From Muhammad to the Present* by Tilman Nagel ([1994] English translation by Thomas Thornton, Princeton: Markus Wiener Publishers, 2000) without diacritical signs with the exception of the following transcriptions: *Qur'an* (as well as the terms derived from it) that I prefer to *Koran; I'jaz; 'ilm; 'ilmiy*. For occasional terms in other languages I have just adopted the transcription provided by my interlocutor. I have maintained the oscillation between the names 'God' and 'Allah' according to my interlocutors' usage.

The conversations are here reported chronologically and not according to the broad subdivision of the interlocutors' orientations hinted at in the *Introduction* and further developed in the *Afterthoughts*. Such an order is reflected in the title of the monograph.

My interlocutors often touch upon philosophers, scientists and authors belonging to different traditions; sometimes reference is made to supposedly well-known figures, such as Newton, Galilei or Russell, and most of the time my interlocutors immediately contextualize such references. However, for less known personalities I have usually strengthened the contextualization with some additional information provided in the footnotes. Such footnotes are mainly intended to help my reader to place the mentioned author(s) in a specific historical and geographical context. In other words, I have limited my explanation to dates and places of birth (and death when necessary) and, whenever relevant, a very short mention of the main work(s) and intellectual or scientific achievements of the author(s) at stake. Of course, some biographical notes might sound pleonastic to the specialists in a field: I preferred to run the risk of explaining what could appear obvious to sounding incomplete. Geographical and chronological data regarding Muslim thinkers and authors are based on the *The Cambridge Companion to Arabic Philosophy* edited by Peter Adamson and Richard C. Taylor (Cambridge, UK and New York: Cambridge University Press, 2005). The years are indicated in reference to the Common Era, or CE.

The problem of other technical terms and expressions proved somewhat thornier. I wanted my texts to stimulate further thinking and questions without sounding 'exotic'. Therefore, I have also used the footnotes to explain specific terms left un-translated or unexplained in the conversation whenever I thought that some fuller grasp of its meaning would increase understanding of my

interlocutors' words. For technical terms I have mainly perused the *Brill Encyclopedia of Islam* online (available at: http://www.brill.com/publications/online-resources/encyclopaedia-islam-online).

In addition to the footnotes, for those readers whose knowledge of Islam is minimal, the final glossary, authored by Dr Tauseef Ahmad Parray (Aligarh University), elucidates recurring Arabic terms in a simple way. The meaning of some scientific concepts that are occasionally mentioned by my interlocutors or used in the passages I quote has been taken for granted (e.g. 'photosynthesis'). However, I am aware of the difficulties of striking a balance, especially in a work ideally aimed at different readerships: what someone regards as platitudes might be perceived by someone else as jargon. I encourage him/her to approach this text with the same curiosity that has motivated me.

Whenever one of my interlocutors refers to an author that I have already mentioned in a footnote provided for a preceding conversation, the information is not repeated.

When my interlocutors have quoted the Qur'an, I have left in brackets the indication of the specific verse(s) right after the quotation instead of referencing it in a footnote. The quotation itself occurs in English as I heard it from my interlocutor. Otherwise, the verses that I quote or refer to come from the version by Abdullah Yusuf Ali (*The Holy Qur'an. Meanings Translated by Abdullah Yusuf,* Al Dar Al Arabia, Beirut 1938 (3rd ed.)). I have also specified if the interlocutor himself has provided a note.

I have chosen the titles given to each conversation; they reflect some relevant passage in my interlocutor's words rather than directly quoting him.

The bibliographic indications at the end of the conversations provide both references to works quoted in the introductions, conversations and footnotes, as well as suggestions for further readings.

In light of these *caveats*, the conversations can even be read independently. However, according to my own experience, I can state that they can be appreciated at best if read in succession, and that they often disclose new meanings if read over again.

CHAPTER 1

Just a Servant of God

Conversation with Adnan Oktar/Harun Yahya

I decided to start my exploration by encountering the author that stands out as the most prolific and perhaps the most controversial one in the contemporary debate on Islam and science; the Turkish religious leader Adnan Oktar, who publishes under the pen name of Harun Yahya (Aaron John).[1] Oktar[2] came to the fore in Istanbul in his late 20s, while studying philosophy and interior architecture design. As a preacher, Oktar blended Said Nursî's (1878–1960) interpretation of the Qur'an[3] with a criticism of Darwinism. Oktar indeed identified the idea of biological evolution with the utmost expression and root of contemporary anti-religious materialism, and attacked it accordingly.

In 1986, following the publication of a book dedicated to conspiracy theories, Oktar was charged with promoting a theocratic revolution and served 19 months in prison, undergoing the first of a long series of legal difficulties. Oktar, who eventually dropped his studies, managed to gather a group of students from affluent families. This group gradually took on the form of a sect, whose activities and internal dynamics repeatedly raised the attention of Turkish authorities. To date, Oktar's biography includes episodes of hospitalization in a psychiatric institution, several imprisonments, legal troubles for possession of cocaine, sexual harassment and blackmailing of collaborators. All such troubles and legal indictments, some of which are pending, are echoed in the Turkish media; however, Oktar himself makes no mystery about them, narrating the

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[1] The definitions of Yahya are mixed. Martin Riexinger (Riexinger 2002) calls him an 'Islamic intellectual'. Halil Harda (Harda 2009), who rather focuses on Oktar's biographical vicissitudes, calls him 'a ludicrous man for ludicrous times'. Nidhal Guessoum, despite criticizing him, employs the labels 'thinker and writer' (Guessoum 2011, 109). As an example of a hasty, supercilious dismissal of Yahya's relevance, I can quote here a recent scholarly evaluation of a research project touching upon, *inter alia*, Harun Yahya (2011): '(...) Given Yahya's strange views on so many subjects, and the court cases he has been involved in with criminal implications, I'm not sure Harun Haya [*sic*] is a worthy subject for such a study. Is there not some other Muslim intellectual figure who defends creationism but who is not tarnished by criminal court cases and other strange beliefs?' My reader will hopefully agree that 'strange' is not a scholarly category at all; more importantly, as I will try to demonstrate, Harun Yahya's religious message cannot simply be summed up as anti-Darwinism, nor can it be easily dismissed with reference to Adnan Oktar's court cases.

[2] When I mention the information that Harun Yahya diffuses about himself, as well as to his publications, I refer to the material that can be accessed from his official web-page http://harunyahya.com/. For Oktar's biography see: http://harunyahya.com/bilgi/yazarHakkinda. For Yahya's books see: http://harunyahya.com/list/type/1/name/Books/.To date, the most complete work on the 'Harun Yahya enterprise' is Ross Solberg 2013, which I did not peruse while working on the present chapter. However, Anne Ross Solberg, whose research was chronologically parallel to my own one, has read and commented upon previous versions of it.

[3] Analogous to Yahya/Oktar, Said Nursî was impressed and influenced by the help offered by technology in general, and communication technology in particular, to the dissemination of the religious message. Moreover, Nursî described the cosmos as theophany, thus criticizing the materialist doctrines of his times. For a reconstruction of Nursî's life and ideas see Mardin 1989.

vicissitudes of his life in interviews and other texts published on the web. The man is presented as extraordinary and outstandingly devout, and his problems are described either as the result of the occult agencies he boldly fights against, or as God's tests which he patiently endures. Oktar's life is described as completely dedicated to the defence of religious truth while his personality is characterized by inexhaustible stamina, passion for knowledge, and fine human traits like tender love for plants and kittens. During filmed interviews Oktar undoubtedly demonstrates a charismatic and self-assured attitude; he is constantly portrayed in very elegant, fashionable clothes and similarly dressed collaborators often accompany him and address him as *hoca* (preacher) and *ağabey* (big brother).[4]

While this chapter was being finalized, almost 300 books in Turkish had been published under the name 'Harun Yahya', more than 200 of which were translated into English. Yahya's official website listed almost 2,000 books in Turkish and approximately 1,300 in English. Furthermore, translations were available in another 60 languages, all widely advertised through more than 150 constantly updated websites. The original nucleus of Yahya's works is produced by a team, whereas the translations are commissioned to, or more probably spontaneously carried out by, sympathizers around the world. The circulation of Yahya's products therefore seems to be both centrally guided and virally replicated. Such works are written in plain language, are highly repetitive, and seem mainly composed from a copy-paste technique; moreover, they portray a system of quotations that does not comply with current standards of scholarship. The books are indeed sprinkled with de-contextualized quotations, for instance from major scientists and scholars along with more controversial figures, with no distinction made between the respective intellectual profiles.[5]

Oktar/Yahya has apparently discovered not only the secret for uninterrupted productivity, but also a source of fabulous wealth. The latter, apparently, is not generated by the royalties from his publications; however, all the books are not only available in glossy, fully illustrated paper editions but can also be downloaded free of charge in different formats from his websites.

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[4] Oktar's legal troubles are thoroughly reconstructed in Riexinger 2002, Edis 2008, Harda 2009, Higgins 2009 and Ross Solberg 2013. Such works offer a more detailed reconstruction of the various aspects of the life and behaviour of Yahya and his followers, which I only lightly touch on here. For a preliminary recognition of how 'new interpreters' of Islam take advantage of the Internet see Anderson 1999. Martin Riexinger rightly emphasized the relevance of such a medium in all his reconstructions of Yahya's ideas and work.

[5] I have personally addressed several scholars in various fields about the alleged quotations from their works that I could find in Yahya's *The Little Man in the Tower*, 2010 (http://harunyahya.com/en/Books/2543/the-little-man-in-the). These are the answers that I received and was allowed to publish: 'My quotations included in *The Little Man in the Tower* were apparently sourced from my reply to an e-mail I received in 2001 from a "Berk Turkcan". Some are fragments whose meaning is distorted by being taken out of context.' (Andrew Bendrups, Faculty of Health Sciences, La Trobe University, Bundoora). 'I am aware of the reference to my name in the booklet *The Little Man in the Tower*. I have never spoken or communicated in any way with the author. So the alleged "quote" on his site is not a quote. I never commented on his work. Neither did I contact him when I discovered that he mentioned my name. I just didn't think it was worth bothering with it.' (Birte Schelling, HafenCity Universitaet, Hamburg). 'I read the quote attributed to me in *The Little Man in the Tower* and it looks like something I would have said (and would still say), though I don't remember being interviewed by Mr Oktar. I might well have been; I just don't recall.' (Thomas M. Crisp, Biola University), (private communications via e-mail, February 2011).

This extraordinary diffusion already renders extremely likely that any bookstore visitor or Internet user interested in Islam and science, sooner or later, comes across one of the texts connected to his name. However, in 2007 Oktar/Yahya prompted the curiosity of potential readers when he sent the gigantic and luxurious first tome of his *Atlas of Creation* (768 glossy pages, 5.4 kg, 27.5 x 37.5 cm, images in motion in hard cover copy), unsolicited and free of charge to natural science teachers, research institutions and libraries as well as individual philosophers or scholars of religion throughout Europe and North America.[6]

Especially over the past two years, Oktar seems to have further intensified his initiatives and diversified his contributions as an opinion-maker in public debates by engaging in different topics: he runs and appears on a television channel (A9), specifically in a long chat show where he sits with men and women whose beauty he emphatically praises, talking about politics and world affairs;[7] his website voices his statements about pan-Islamic unity, Turkish nationalism and, more recently, building bridges with Israel.

Despite his controversial reputation in his home country, his extravagant TV appearances – some of which have become viral YouTube clips (especially those in which he flirts with heavily made-up young women) and the peculiarities of his books, Oktar/Yahya still enjoys worldwide respect by readers who seemingly do not attach importance to such aspects. In 2010 Yahya was selected among the top 500 most influential Muslims by the *Royal Islamic Strategic Studies Center* in Jordan.[8]

It is difficult to catch a glimpse of the real dimensions, sources and scope of Oktar's activities, including the network of the actual people and institutions supporting them, behind the flood of multi-coloured books, websites, TV programmes and the inexhaustible self-promoted information about and praise of Oktar's life. In 1990, Oktar founded the *Scientific Research Foundation* (SRF: in Turkish, *Bilim Araştırma Vakfı*, BAV). The *Foundation for the Protection of National Values* (*Millî Değerleri Koruma Vakfı*, or MDK) followed in 1995. The goal of the SRF, whose website boasts the organization of over 2,600 scientific events in Turkey and abroad, is the '(...) establishment of a worldwide living environment that is dominated by peace, tranquility and love';[9] it is principally devoted to the defence of creationism. MDK instead seems more focused on Turkish issues. However, their real extent and connections, besides official statements, can only be estimated. Yahya must have powerful foes and friends alike. Telling attributes in this regard are not only his immense results, intense marketing and massive free distribution (which presuppose huge financial backing), but also the pressure that he was able to exert on several occasions on

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[6] See Dean 2007. While this chapter was being written, the Center for Middle Eastern Studies (Lund University) received the second volume. Through the CMES Director, I had borrowed a copy of Vol. 1 originally received by Lund University's Rector Magnificus, which I perused in order to produce the present article. The illusion of motion on the *Atlas*' cover is produced through lenticular printing.

[7] See http://en.a9.com.tr/; Krajeski 2013 expands on Yahya's 'kittens'.

[8] See http://www.rissc.jo/index.php/english-publications/miscellaneous/119—the-500-most-influential-muslims.html.

[9] See http://www.srf-tr.org/statament.htm.

the Turkish government in order to block web sites perceived as hostile, like Richard Dawkins' official site in 2008.[10]

Oktar's biography must be recalled since it is part and parcel of Yahya's narrative, and also because it is relevant to understand the reception of Yahya in his home country. Yet, as Taner Edis states, Harun Yahya is rather the name of a 'brand' and Adnan Oktar is 'the public face' of such a brand.[11] In the following paragraphs, before reading the exchange I had in person with Mr Oktar, we can leave aside his biography and all those aspects that are more liable to be deepened by investigative journalism, and rather linger on the ideas propagated under the name 'Harun Yahya' as a brand. I will refer to the cluster of such ideas with the expression 'message'. However, another necessary *caveat* is that Yahya's message, due to the way in which it is produced and disseminated, can be easily doctored, reshaped and adapted by emphasizing or deleting single aspects of it over time: old subjects and stances, as well as online records, can be dropped[12] while new topics can be addressed and emphasized. This poses specific challenges to all those who intend to study Yahya from a scholarly perspective.[13]

According to Yahya, Darwinian evolutionist doctrines are the source and least common denominator of all the violent and repressive phenomena of the last century, such as terrorism and totalitarianism (communism and fascism alike), all rejected on a par with racism, romanticism, capitalism, Buddhism (*sic*) and Zionism (which to date he explicitly distinguishes from Judaism after a flirt with Holocaust denial in the 1990s). Yahya considers them all interconnected not only because, in his view, they stem from and foster materialism, atheism and pessimism, but also because he claims that they received constant support from freemasonry through the millennia; he describes this agency as the principal occult actor of history in all its anti-religious manifestations. Yahya sees Darwin as the major advocate of evolutionism, however he also claims that evolutionist doctrines date back as far as the ancient Greeks and Egyptians. Yahya rejects Darwinism by following a double-track criticism: on the one hand he points out its moral consequences, highlighting the supposed disastrous effects of Darwinism-inspired ideologies, policies and actions he envisages in history. On the other hand, he deems Darwinism unscientific since he claims that it lacks material proof (such as fossils of 'missing links') and cannot account for the complexity of biological forms. Finally, in order to fight more efficaciously against materialism, Yahya endorses a theory of the in-existence of matter, which according to him is continually recreated by God. Despite the common polemical target, he refuses to identify his position with that of the advocates of 'intelligent design', according to whom the complexity of some features of living beings can only be explained by referring to a direct intervention by a divine designer, because they do not make explicit reference to Allah. Moreover, he

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[10] See Randerson 2008.

[11] Edis 2008.

[12] See Riexinger 2008 and Hameed 2009.

[13] For instance Martin Riexinger points out that the very fact that Islamic creationism was propagated on the Internet explains, among other factors, why it was initially overlooked by scholars (Riexinger 2008).

believes the very reference to a 'design' limits the concept of divinity and agrees that the Earth is millions of years old.[14]

Against the evils that affect contemporary society, Yahya endorses an ecumenical and messianic form of Islam based on a return to religious values and whose symbols and examples are found in the prophets. According to Yahya, the coming of a Last Prophet or Mahdi is near; he will appear and begin his activity in Turkey, the country that Yahya considers endowed with moral superiority and therefore apt to take on the leading role in the event of an Islamic union. It should be noted that, despite refusing to explicitly identify the Mahdi, Yahya constantly describes him in a way that, curiously, fits Oktar's own profile.[15]

I have underlined how Yahya actually discusses the more dissimilar questions, even if he presents the topics of his discussions as deeply interrelated. However, if we consider the ambition expressed by the initiative of sending out the *Atlas of Creation* to institutions all over the world, and the general appeal of all such discussions to different audiences, it seems safe to assume that the most relevant aspect (that is, the one most likely to endure and to entice a global audience) of Yahya's production is his 'philosophy of nature'. Such philosophy of nature is represented by Yahya's discussion of Darwinism and, more generally, by the way he presents nature in his works.

Let us take a closer look at Yahya's philosophy of nature. While subscribing to the known doctrine according to which the miraculousness of the Qur'an is proved by its linguistic beauty and inimitability (*i'jaz*), Yahya utterly emphasizes its supposed 'scientific miraculousness' as well. An inspection of his books, such as *Allah's Miracles in the Qur'an*, shows that Yahya endorses the idea that the Qur'an mentions natural phenomena that were not known in detail (or wrongly known) at the time of the revelation, as well as technological inventions. Yahya mentions 87 cases, one of them being the Big Bang. Furthermore, the Qur'an, according to Yahya, predicted historical events and technological developments; he mentions 14 predictions, among which are the preservation of the mummified body of the Pharaoh who pursued Moses, the Moon landing, coronary bypass surgery and atomic technology. Moreover, Yahya holds that the Qur'an displays patterns of word repetition which, associated to numerical values, have a correspondence with reality (e.g. the word 'day' occurs 365 times) or special symbolic values; for instance sura 54 ('The Moon') gives a numerological interpretation of 1969, the year of the successful Apollo 11 mission. *Prima facie* then, a consistent part of Yahya's message seems to stem from, or replicate, the kind of exegesis previously referred to as Bucailleism.

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[14] For a reconstruction of Yahya's theories in the wider context of creationism, and a comparison with U.S.-based Christian creationism see Numbers 2006; 421–427 and Numbers 2009. The analogies of Yahya's ideas with Christian doctrines are underlined in Bagir 2005. For a thorough and clear reconstruction of how Muslim intellectuals reacted to Darwinian ideas see Ziadat 1986 and Howard 2011.

[15] In order not to clutter the explanation and the chapter with a plethoric apparatus of footnotes that replicates the elephantiasis of Yahya's own work, from now on I do not give the single bibliographic indications, nor the URL of Yahya's books (not even those explicitly mentioned in the chapter); however, Yahya's book(s) and/or articles on a specific topic can easily be retrieved through a web search for his name together with the topic itself. For instance, a Google search for 'Harun Yahya' and 'Buddhism' yields as a first result http://harunyahya.com/en/works/732/islam-and-buddhism.

Yahya constantly celebrates nature, which is lavishly illustrated in his books, and describes natural phenomena as 'miracles'. In this sense, the whole universe is, as the title of one of his books demonstrates, *A Chain of Miracles*. Yahya regards all the features and elements of the universe as clear proof of the existence of God. According to Yahya, everything in the universe is essential (which means necessarily made for human life) and conversely, inevitably pointing at the existence and benevolence of God. Yahya usually describes these phenomena in plain language, further enriching the description with a number of schemes full of numerical data, and occasionally sprinkling the description with supposedly relevant Qur'anic quotations, including passages from (allegedly) prominent scientists. Finally, he insists on the necessary character of the phenomenon upon examination with a sort of 'counterfactual reasoning': if the phenomenon in question would not exist, life would not exist either, therefore God exists and He is benevolent. This scheme has been applied by Yahya to numerous specific phenomena which respective books have been dedicated to: the term 'miracle' has so far been associated by him to (in alphabetical order): animal migration, ant, atom, blood and heart, cell, cell membrane, DNA, electricity in the body, enzyme, eye, honeybee, hormones, human creation, immune system, microworld (*sic*), molecule, mosquito, photosynthesis, plants, protein, seed, smell and taste, spider, talking birds and termites.

Despite Adnan Oktar's apparent interest in more visibility, setting up an encounter with him took me several weeks of somewhat complex negotiations, beginning at the end of November 2010. In my correspondence with one of his collaborators I had to specify that I was not interested in investigative journalism, and that I preferred to ask my questions in person to Mr Oktar rather than having them answered via e-mail, as was proposed more than once. We agreed upon a week in February during which, most likely, Mr Oktar would meet me. I actually boarded an airplane to Istanbul with no settled date for our encounter or a guarantee that we would actually meet. In the late afternoon of 11 February at a representation of *The Tales of Hoffmann* at the Süreyya Opera House in Kadiköy, I received a message on the phone. Adnan Oktar would meet me that night. One of his collaborators would meet me next to the Swedish Research Institute in Istanbul, where I was staying.

A well-dressed gentleman called Ali met me at ten o'clock at a location close to Taksim Square and drove me to a villa on the Asian side. I waited in a somewhat extravagant living room with a huge TV screen, while Ali, who did not present himself in detail but stated that he had been lecturing all over the world, kept telling me about the extraordinary qualities of Oktar as well as about the impact of Yahya's doctrines. I was served two Turkish coffees and a cup of tea. The reception, albeit unusual, was very friendly.

Mr Oktar made a short, unexpected appearance around midnight. He was dressed in an elegant blue suit. I could not help thinking that he looked slightly more strongly built than in his pictures, but I also noticed his very pleasant perfume. After a short introduction by one of his collaborators, Oktar caressed my face in a fatherly manner, smiled and promised he would have time to speak to me two hours later.

More conversation with Ali followed. According to him, in the 1960s and 1970s the acceptance of Darwinism in Turkey was 80 per cent. Now the acceptance of Creationism was 95.6 per cent due to Yahya's impact. I was shown some figures regarding Yahya's popularity, according to the access to his websites: allegedly, the U.S. held first place, followed by the UK, Indonesia, Russia and Malaysia. Ali told me that the organization was comprised of 300 people. The books, he specified, were written under Oktar's supervision by 30 people whom he described as 'academics'. However, Ali explained, Yahya would always tell them what materials to look for, and provided the outline of the work to be done. Ali also remarked that the books were designed to be colourful and luxuriant so they were easily spotted in the libraries and bookshops.

I was also given numerous, if scattered, pieces of information about the religious leader and author. For instance, Ali informed me that Oktar was not married, but his mother was still alive, and he had a brother (who is a medical doctor) and a nephew. Ali stated that he had never seen him angry. He added that Oktar worked on gardening projects, and that he did not earn money for that but inspired people who would earn money from his ideas.

As a child, Ali reported to me, Oktar was no *enfant prodige* yet he had shown signs of his future greatness. For instance, when he was seven or eight years old his mother took him to a wedding and there he started wondering if all those joyful people around him were aware of the nothingness of life. Also the 'secret of matter' (i.e. the thesis that matter is a dream created by God) is an intuition that occurred to Oktar during his school time. Colours, added Ali in order to explain, do not exist. Perceptions do not exist. Matter does not exist: 99.99 per cent is emptiness. Ali even mentioned the movie *The Matrix* (1999) while explaining the doctrine of the non-existence of matter. We are 'free in an illusion given by God', according to Ali's words.

Subsequently, Ali continued to provide me with unsystematic pieces of Oktar's biography. When he was 30, some very respected *shaikh* met him and told him that he was a rose that had not yet opened. People would struggle with him, but they would lose. The *shaikh* also predicted Oktar would do a unique work for the Islamic world. I was also informed that Yahya is descended from the Prophet but also that he had not yet performed the pilgrimage to Makka, and regretted it.

Ali pointed out that Yahya, even when he criticizes he never uses aggressive language. Oktar, according to Ali, comments on the women's beauty because it is a sign of Allah. These comments are not malicious, observed Ali, since the beauty is forwarded to Allah. The girls surrounding him in the programmes I was told, 'can be Russian models, can be pop singers, can be our mothers or our sisters'. Ali added that there are women who decided to keep their chastity after listening to Oktar.

'He is not a supernatural person' I was informed upon asking. Oktar does not perform miracles. If somebody were to tell him that he was cured through him he would answer, according to Ali, 'Brother, do not be stupid!' But he is a good psychologist, Ali added, 'He understands your mind.'

When the conversation touched upon local issues, Ali stated that Oktar exhibits the flags of Azerbaijan and Turkey in his shows as a symbol of unity. Yahya argues as well that the founder of the Republic was a sincere and practising

Muslim, and this was also proved by the fact that he was the first one who had the Qur'an translated into Turkish. Atatürk, according to Yahya, always carried a pocket-sized Qur'an and prayed regularly. However, Oktar, pointed out Ali, is not seeking political power: he might have many followers of course, but he refuses. As stated by Ali, Oktar had many contacts with important politicians, who had even asked him to run for elections, but he declined. Democracy in Turkey could be better, said Ali, and he added 'But not politics, the circumstances.' Ali explained that Oktar intervenes on world issues whenever he is able to. For instance, he had stated that former Iraqi dictator Saddam Hussein should be exiled, not executed. But then, Ali told me, Oktar was not 'disappointed' when it happened. Ali reported as well that a spokesman of the Iranian president Ahmadinejad had come to Oktar seeking advice. Oktar had persuaded Ahmadinejad to change his mind on the use of nuclear weapons against Israel. That can be proved with the press, even if Ahmadinejad would never reveal the friendship, stated Ali.

About the hardships he had to endure, Ali explained, Yahya used to state that 'the more they come to me, the more I work'. He defined himself a 'crazy lover of God' and stated 'Love has to be proven, otherwise it is no love'. The more the hardships, the more the love, said Ali. According to my interlocutor, Yahya used to say, 'I am looking for troubles.'

'Is there a "Nr 2" in the organization?' I asked. No, specified Ali, they were all 'brothers' and 'sisters' and they did not get paid either. Oktar, according to Ali, was just better than the others, because he had proved it in life, but basically nobody can know who is closer to Allah.

Ali then compared the rejection of Yahya's *Atlas of Creation* with Nazi book burning. The secret services, in his opinion, 'are our brothers. We love them. They protect us against terrorist maniacs.'

I decided to ask blatantly whether Oktar was believed by his followers and collaborators to be the Mahdi. Ali stated that they hoped so. 'When the Mahdi comes, Oktar says, he will be there to open the door.' Ali also pointed out that there were analogies with him, for example his physical appearance.

One of Ali's statements that struck me was 'Not all Darwinists are terrorists but all terrorists are Darwinists'. This slogan has specifically the same structure of another notorious one – unfortunately quite popular in some right-wing circles in my home country – regarding Muslims and terrorists.

However, I must admit that at some point I felt so tired that I asked quite pointless questions such as whether Mr Oktar was able to drive a car and whether my interlocutor would give his life for him. Both were answered in the affirmative. 'But,' Ali added, 'I rather prefer to drive for him. And I do not think that he would ask me to give my life for him.' Later we were requested to leave the room and go outside for a while, since that very room had to be 'prepared for other guests'. We therefore waited outside in the garden, looking at each other, somewhat in embarrassment. After entering again we came to a sort of sitting room on the second floor with a mirrored wall and a closet. I started feeling a deep unease there when they left me alone for several minutes with the door closed.

I finally interviewed Mr Oktar after three o'clock in the morning. He joined Ali and me with another very well-dressed collaborator who spoke excellent English with an American accent, acting as interpreter – he qualified himself later as a brain surgeon who has studied in the States.[16] A third person was present, less elegant and less fluent in English. He was toying all the time with a mobile phone.

The interview proper was preceded by some small talk about my day, and I had the impression that Mr Oktar could understand basic English. He sat on a sofa next to me and the interpreter. I was allowed to record the interview – they recorded it as well. Oktar offered me some chocolate and ate it himself while speaking. He was smiling but most of the time he did not look at my face – rather at a point behind me, in front of him.

Given the limited time at our disposal (shortened by the fact that both questions and answers would be translated) I had decided to pose approximately ten questions touching upon issues not directly read in Yahya's texts, such as the importance of specific authors in the development of his work. I had also decided to stick to my commitment not to ask any questions that could be interpreted as 'investigative journalism', a principle that I had also tried to observe during my interaction with Ali. My hope was that Adnan Oktar would provide me with articulated answers.

Stefano Bigliardi: Thank you for your time. I will ask you ten questions. I hope you will not find them annoying.

Adnan Oktar: Please go ahead.

SB: The first question is: would you define yourself as a philosopher?

AO: No, I am just a servant of God. An ordinary person.

SB: I ask this question because I have noticed that in your books you mention several philosophers, like Bertrand Russell.

AO: Yes, some philosophers have compatible ideas with Islam but my ideas are Islam.

SB: I see. I noticed, reading your books, that you frequently mention miracles. The term 'miracle' occurs quite often in the titles of your books. Sometimes miracles are natural phenomena. Sometimes they are supernatural phenomena, like the splitting of the Moon in sura 54. How do you interpret miracles?

AO: Yes, at the time of our Prophet, with a wave of his hand, the Moon was shown to the humans by God as split in two. To some people it looks like an illusion, to some people it could look like hypnosis. But as a Muslim, it was real for us.

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[16] Anne Ross Solberg later identified the person as a key figure of Mr Oktar's organization, Dr Oktar Babuna (see Ross Solberg 2013, 12).

SB: al-Faruqi said that every Muslim is a scientist and every scientist is a Muslim.[17] Do you agree with that? Do you think there is a special harmony between Islam and natural science?

AO: It is a beautiful word.

SB: So you are not a philosopher – you said. But you are also inspired by Muslim philosophy. For example in an interview for Al-Jazeera you have quoted Al-Ghazali. Are there other Muslim philosophers who influence you or whom you recommend reading?

AO: Yes, well, if they are compatible with the Qur'an, we are compatible with them inshallah, we use that. The only thing is that we ally with the philosophers in Islam. If we ally in Islam it is fine. [Ali adds: 'They are not compatible with each other but they are compatible with the Qur'an. This is why.']

SB: How important is Nursî's for your work?

AO: Yes he is the greatest renovator of the religion. Before and after.

SB: And what about Maurice Bucaille?

AO: His books are useful. He has effective findings and effective style.

All of them, the philosophers, might have some effective findings, for example, even Karl Marx had effective findings. Like Hegel also, for example. They might have, yes.

SB: You have been writing books for 24 years. Is there any point on which you have changed your mind, where you had some kind of development?

AO: Yes, to some extent, yes. [Ali adds: 'Minor issues.']

SB: For example?

AO: For example the Mahdi. In the beginning I didn't say he is a person, but afterwards I stated he is a person.

SB: I understand. Are you satisfied with the state of scientific education in Turkey?

AO: Yes, for example I would like to teach the history from movies, as a film to the students, and whatever they can remember by heart, they can like that. [Ali adds: 'Learning by heart is not good - he says'.]

SB: Is your message directed at all Muslims – do you draw any distinction between Sunnite and Shi'ite Muslims?

AO: I target all Muslims as a whole because the Qur'an targets the Muslims as a whole. So this is the reason for the Mahdi coming to this world: to remove

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[17] This statement is heard in the movie *The Book of Signs* about Bucaille's theories, in which al-Faruqi makes a brief appearance as well (see the *Introduction*).

all the sects to bring all the Muslims together as a whole community...There is no separation in Islam for the Muslims.

SB: A last question. Islam and science. The harmony between Islam and science has also been taken up by other scholars. By the Egyptian geologist El-Naggar for example. My question is: do you feel part of a common enterprise or there is something unique about your work?

AO: Yes there are some... many models. However our model with our friends is very effective, it has a lot of impact in the world. This can be seen.

SB: Thank you very much.

AO: Thank you.

Before the last two questions, Oktar left the room for another half an hour allegedly in order to greet people from some country who were insisting on seeing him. During his absence the person acting as interpreter somewhat robotically lectured me on Darwinism. At the end of the interview I was allowed to also take some pictures, but I was in turn photographed with Mr Oktar (who had left the room once more, to dry his face, he stated) Ali would not tell me what would happen with the pictures: 'Maybe you will find them on the net, maybe not.'

Ali drove me back to the Swedish Institute, where I arrived approximately at five o'clock in the morning. I crashed out, exhausted, on my bed, not before having informed my colleagues and friends that the Yahya mission had been accomplished.

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CHAPTER 2

A Qur'anic Metaphysics for Science and a Common Ground for Monotheistic Religions

Conversation with Mehdi Golshani

Mehdi Golshani (1939, Isfahan) is a Professor in the Physics Department of Sharif University of Technology (Tehran). He received his BSc in Physics from Tehran University in 1959 and his PhD in Physics in 1969 from the University of California, Berkeley. Golshani complements his competence in the field of physics with a philosophical background encompassing Western and Muslim thought and emphasizing Shiite sources. His works stand out first and foremost as a plea for metaphysics against the conviction that science is self-sufficient. In *From Physics to Metaphysics* (1997) he reconstructs and rejects the reasons why natural scientists have dismissed philosophical speculations. Such a dismissal, according to Golshani, results in the subscription to an implicit, naïve and uncontrolled philosophical outlook. In his view, science cannot be separated from metaphysics since it constantly relies on concepts not derived from experience and it is based on principles that are not dictated by the facts that science studies. The idea that philosophy is irrelevant for physics is illusory; Golshani points out that even the rejection of philosophy must be philosophically argued. Such rejection is also *bad* philosophy: an impaired understanding of science, Golshani argues, has an impact on science itself, resulting not only in a theoretically impoverished approach to nature, but also in an unleashed, destructive use of science.

Golshani's complementary argumentative strategy is to locate metaphysics for science in the Qur'an, to which his monograph *The Holy Qur'an and the Sciences of Nature* (2003) is especially dedicated. Golshani points out that the Qur'an emphasizes knowledge and that it refers to the phenomena of nature and their study, which can be pursued as an act of worship. In the Qur'an, Golshani finds concepts related to what he sees as a sound philosophy of science: emphasis on sensory knowledge but also on the necessity of transcending it through intellect; belief in unchangeable patterns underlying natural phenomena which helps the systematization of knowledge, and the principle of general causality. While belief in such principles rightly guides science, belief in a purposeful and God-depending universe, in Golshani's view, also prevents a destructive use of technology. Golshani recognizes the existence of 'inspiration' and 'enlightenment' as means for knowing the world, but he does not consider it as a

general route through which knowledge is obtained since they are occasionally bestowed on saints, scientists and poets.

According to Golshani, the harmony between Islam and science is historically proved by the existence of outstanding Muslim intellectuals in the past. In light of such harmony, the present state of science and technology in the Muslim world, which Golshani sees as in decline, appears inexcusable. It is possible, according to Golshani, to speak soundly of an 'Islamic science'. This should not be identified, in his opinion, with the research of specific scientific notions in the Qur'an, since the latter is a book of guidance and the truth of its statements should not be anchored to 'changeable theories'. Nor is any 'Islamic science' viable, according to Golshani, if by that expression we mean science recast anew on Islamic principles. We should rather look for a theistic interpretation of science, an interpretation whose main concepts and principles stem from the Qur'an.

I met Professor Golshani at the Institute for Research in Fundamental Sciences in Tehran on 7 April 2011. It was a sunny morning, and the heavy traffic in the Iranian capital, at least at that hour, seemed to have relaxed its grip around the area where the Institute is located. The wonderful images of Isfahan, the professor's native city that I had visited in the previous days, were still fresh in my memory. Meeting Professor Golshani was no exception to Iranian hospitality: he is as determined in the defence of his views in academic talks and writings as he is amiable in personal interaction. I immediately felt at ease, and tea and traditional Iranian pastries sweetened our conversation.

Stefano Bigliardi – Professor Golshani, many authors have been defending the harmony of Islam and science in the past, and some have embarked on this enterprise in relatively recent times. I would like to start by discussing how you see them in a comparative perspective and how you place yourself among them.

Mehdi Golshani – In the name of God, the Most Compassionate, the Most Merciful.

You see, I think there is more convergence among views today. If you look at the four views expressed, respectively, by Bucaille, Nasr, al-Faruqi and Sardar, they did not converge a great deal. I think that contemporary authors are approaching each other now and that is because certain things have been shown in the philosophy of science studies. It was usually thought that science by itself is self-sufficient and that it derives all of its knowledge from empirical data. Now it has been shown that science has a lot of presuppositions, which are mostly metaphysical in nature, and that religion too, apart from the religious rites, has a strong metaphysical foundation. My own view is that religious metaphysics – and here I am not talking about Islam only but include all monotheistic religions – provides a very inclusive framework which accommodates science. I do not see scientific activity as different from the usual religious activity. My mentality is the same as the mentality of scholars in the Islamic civilization era and that of Newton, Maxwell, etc.[1] They all

[1] James Clerk Maxwell (1831–1879), Scottish theoretical physicist, father of the theory of electromagnetism.

considered the study of nature as part of their religious duty and as a sort of worship. Of course, scientific work has to be done with its own tools. In my view, however, the religious world-view is more inclusive than the present scientific one, as it does not confine the whole universe to the material domain only, that is, it has a wider perspective.

The point that is usually neglected and I have been trying to show in my book, *The Holy Qur'an and the Sciences of Nature*, is that Islam places a lot of emphasis on rationality. Some religious people neglect it because they think that they can only get their answers from their holy book. But you know, we have in the Qur'an a verse which is very clear on this matter: 'Go around the Earth and then reflect on how He started the creation' (29:20), which implies experimental as well as theoretical work. Problems have arisen between scientists and religious people because both sides have exceeded their limits in declarations. Scientists have been claiming that they exclusively have the right to say things about the natural world. But science is full of philosophical questions, which cannot be answered by science alone. This is one thing. On the other hand, some religious people think that they have to get everything from their holy books. I think we are specifically asked to study nature by our own effort. Of course, the scientist's world-view is very important in accommodating things and in my view a more inclusive religious world-view is more appropriate. So, in the personalities that have appeared in the last 20 years these points have been taken more and more into consideration. In fact, in the last edition of my book *Can Science Dispense with Religion?* I added a new chapter entitled 'Afterword', in which I compared the views of 62 Christian and Muslim scholars, which showed a lot of similarities between Muslim scholars and some of the Christian physicists or philosophers. You see, I gave a lecture in Berkeley in 1998, and it was in a workshop, and a physicist was supposed to criticize me, and he was a celebrated Jewish scholar. He said, 'I do not have anything to ask, I only ask a question which does not have to do with your present discussion.' This means that there are many commonalities that deserve to be explored.

SB – So, your emphasis is more on the points you have in common with other scholars, but what do you think about individual differences between advocates of the harmony between Islam and science?

MG – Most of them see complementarity between Islam and science. In other words, they think that science and religion deal with complementary aspects of life. I do not see that much separation. I think the same way as, for example Charles Townes[2], the Nobel laureate in physics, that there is a common ground between Islam and science. The philosopher Roger Trigg[3] also has the same view. I think the religious world-view, if it is taken in its inclusive form, doesn't deal with minor things but deals with metaphysical positions at the most fundamental level.

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[2] Charles H. Townes (b. 1915), U.S.-American physicist. For his work in quantum electronics he was awarded the Nobel Prize in 1964 together with Nikolay G. Basov and Aleksandr Prokhorov.

[3] Roger Trigg, Emeritus Professor of Philosophy at the University of Warwick.

SB – What about popular authors such as Harun Yahya or El-Naggar?

MG – I have differences of opinion with them as far as priorities are concerned. They sometimes want to prove scientific miracles in the Qur'an. In my view, the Qur'an is a miracle. I am not trying to compare various scientific findings with the Qur'an, because science is all the time developing. For example, the planet Pluto was discovered in 1930 as being the ninth planet of the solar system. But in 2006, The International Astronomical Union excluded Pluto as being a planet. Now, how could we adapt our religious texts with number eight or number nine, once it is changing? At the moment some very important and fundamental theories of science are at the stage of controversy, and some eminent scientists do not consider them last words. There are fundamental challenges that are in front of our theories. So, we should be cautious in adapting our religious texts with the current science. The authors you mentioned rely too much on the comparison of science with religious texts.

SB – Do you think that they can still have a positive role?

MG – You see, I think they have a positive role to an extent. But unfortunately their negative role has been more manifest because a lot of people in Islamic countries have worked on and given wide visibility to the scientific miracles of the Holy Qur'an. I think it is the duty of Muslims to discover nature on their own. Of course, they can find some evidence here and there, which is very important. For example, at the present stage of physics we think that everything appears in nature in the form of pairs. We have electrons and we have protons. We have man and we have woman. Specifically, if you enter in the domain of particle physics, which deals with the elementary constituents of nature, you see this duality. There is a verse in the Qur'an which says, 'We created everything in dual form' (51:49). Now, once you see this, you become overwhelmed and it can give some impetus to scientists to look more for this kind of property in nature. But I think it is our duty to discover nature by ourselves. Of course, as far as epistemology is concerned, I think that the holy texts, specifically the Holy Qur'an, is very explicit on some points of view, and so it can be very helpful. It can distance you from positivism and similar schools. As an example, consider the problem of causality. You see, no Muslim philosopher defends acausality. All of them without exception defend causality, and if you go through the Qur'an you see that the matter is clear. Of course, there are some verses that indicate otherwise, but those verses can be very easily interpreted. This means that you bring in the role of secondary causality to explain physical phenomena. There is also primary causality. God does things certain ways, using certain agents (secondary causes) so all of the relevant verses can be interpreted in terms of causality.

As a Muslim, once I am confronted with the absence of causality in some indeterministic theories of physics – quantum theory – I do not accept it easily. So at the moment I am working on causal formulations of quantum theory. That has had an effect on me at the epistemological level and I have found it to be very helpful. Those authors that you named are mostly looking

for the scientific miracles of the Qur'an. This is OK, but it could distract your mind from discovering nature yourself, and of course, the enjoyment that you can get from it is different. It's for that reason that if you look at scientists in the Islamic civilization era – not theologians – you see that all of them were studying nature in the way we do today: experimentation and theoretical work. This they picked up from the Qur'an. They were always under the impression that the study of nature is a part of their religious duty, because that is going to bring you closer to God. That was their argument. So the same kind of words that were said for example by Al-Biruni[4] in the Islamic civilization era were also said by Boyle,[5] Newton, etc. at the start of modern science. Their mentality was the same.

SB – What is, more specifically, your judgement on Maurice Bucaille?

MG – Well, Maurice Bucaille is also in the same school as these other two that you mentioned. His work is also focused on the scientific miracles of the Qur'an. His whole book is essentially that. That is useful for some people but I think in the long run it is a deficient thing. Scientists in the Islamic civilization era appealed to rational arguments and in this they were inspired by the Qur'an: 'Bring me your arguments, if you are truthful' (27:64). So one's judgement has to be a rational one. This is the most important thing. And if you look at the eminent Muslim philosophers you see that all of them were rationalists as well as realists.

SB – After 'scientific miracles' let us tackle the concept of miracle. Actually, we use the term 'miracle' in English, but the term in Arabic is actually something else – it is *ayah*, which means sign. However, what is defined as a sign in the Qur'an at times is some natural phenomenon, sometimes it is even a human phenomenon, like the ships on the sea, and sometimes it is something we would define as supernatural. So, don't you think there is a sort of risk of confusing things if we use the term miracle without distinctions for all these phenomena?

MG – You see, on this point I refer to Professor Mutahhari.[6] He is saying essentially, as other Muslim philosophers said, that a miracle is not the breaking of the laws of nature, it is taking place through different laws of nature which we do not know, or through the cancellation of a law by another law.

Let me give you an example that always comes to my mind. You see that something is suspended in the air in this room and you know the force of gravity. So you might think that the reason it does not fall is a miracle. But if you know that there is a magnet in the ceiling that attracts it, then you know

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[4] Abu al-Rayhan Muhammad ibn Ahmad al-Biruni (Kath, Khwarezm, modern-day Uzbekistan, 973 – Ghazni, modern-day Afghanistan, 1048), Muslim scholar and polymath. Most notable for his work in the natural sciences and for his pioneering comparative study of religions.

[5] Robert Boyle (1627–1691), Anglo-Irish natural philosopher, he counts among the founders of chemistry.

[6] Ayatollah Murtaza Mutahhari (1920–1979), Iranian scholar and cleric, disciple of Ayatollah Khomeini.

that the electromagnetic force cancels the force of gravity. So, what they are saying – and I have used their explicit words – is that it is not the breaking of the laws of nature, it could be the confrontation of a law with another law or it could take place through some law that we do not know yet. That is their explanation. It is the position of philosophers, not theologians. The Muslim theologians belonging to the Asharite[7] school deny the secondary causal agents and say that miracles are occurring because God's habit is broken. God usually does things in certain ways and in the case of miracles God's habit is broken. So they think that the only agent, the only cause, is God. This is the position of some but not all Muslim theologians. Muslim philosophers do not believe in any breaking of the laws of nature.

SB- So, if I understand you correctly, miracles are not really a problem because they are natural phenomena. They are just natural phenomena, which occur according to laws of which we are not aware. Not yet.

MG – Yes. Of course, they have said that but by this they do not mean to deny supernatural agencies. We cannot discover supernatural causes, as we are physically limited. But even those supernatural agents or causes, are not God Himself. However, while they do not deny supernatural secondary causes they say that miracles could be the effect of unknown physical causes.

SB – Do you make a distinction between Qur'anic miracles and miracles which are reported in other narratives? For example in the Bible, or miracles which are reported about Sufi saints like *karamaat*? Can miracles still happen?[8]

MG – You see, unusual things could happen. It is a difference of degree. Some Sufis and some mystics in India do very strange things. Even the philosopher Bertrand Russell, who was a positivist, was amazed at the things that were done by Indian mystics. So, I think the occurrence of something unusual is still there. It is a matter of degree. In my book *The Holy Qur'an and the Sciences of Nature* I talk about intuition. Intuition is a lower degree of what we call revelation in the case of prophets, and intuitional discoveries have happened to a lot of scientists. I have given the example of the confessions of some important scientists of our era. They confess that they have witnessed unusual discoveries. For example I have a quotation from Hoyle,[9] an eminent cosmologist of our era, who considers the composition of Beethoven's ninth symphony when he was deaf the result of some cosmic signal reaching his mind. Hoyle says that he asked his friend Richard Feynman[10] about the number of times he had witnessed this sort of thing.

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[7] Ashari, a school of Muslim theology founded by Abu al-Hasan al-Ashari (873–935).

[8] I am referring here to wondrous deeds performed by Sufi saints; see the *Introduction*.

[9] Fred Hoyle (1915–2001), English astronomer and mathematician; he coined the expression 'Big Bang' in order to ironically define the cosmological theory that he opposed, along with other scientists, while endorsing the theory of a 'steady state' universe.

[10] Richard P. Feynman (1918–1988), U.S. theoretical physicist. For his work in quantum electrodynamics he was awarded the Nobel Prize in physics in 1965 together with Sin-Itiro Tomonaga and J. Schwinger.

Feynman's response was four. I think a prophet's revelation is at a much higher level than scientists' intuitional discoveries.

SB – When we read that the Red Sea was divided, that can be a case of a miracle that looked miraculous and supernatural during Moses' time, but doesn't look like such anymore because we can explain it, for example in geological terms...

MG – Yes. But that is due to the fact that we know more laws now, and the miracle was really a miracle for the people of that time.

SB – ...But still we cannot explain how Moses' staff turned into a snake...

MG – It goes back to our ignorance of the laws and causes (natural or supernatural).

SB – So you do not exclude that maybe, one day, we will be able to explain in physical terms how Moses' staff turned into a snake...[11]

MG – I do not exclude that possibility, but I have to add that I am not sure that we can eventually explain every physical thing. One reason is due to Gödel's theorem in mathematical logic, proved in the early 1930s, which says that you do not have a self-sufficient set of axioms in mathematics, and if you accept a couple of axioms you always can find statements that you cannot prove whether they are false or true through your axioms. So, some eminent physicists of our time are saying that we cannot be hopeful about reaching a theory of everything. More and more attention has been paid to this theorem in the last 30 years.

SB – So we are not going to explain everything...

MG – ...No, not necessarily. Unless the theorem is disproved, and in the last 80 years nobody has disproved it. Furthermore, our capacity for explaining natural phenomena is always limited. Of course, we should never stop our search.

SB – So, any time we find in the Qur'an – specifically in the Qur'an – a narrative that is about a supernatural event, you do not advocate a metaphorical interpretation of it – we can take it literally, we can say: 'It has been like that, we just do not know the law, or we didn't know the law.'

MG – Yes. That's the way. Of course, we should never neglect alternative interpretation given in the authentic Islamic traditions (*hadith*).

SB – ...So, you do not support any metaphorical interpretation, not even when it says that the Moon was divided in two parts (54:1)...

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[11] See for instance the Qur'an 20:17–21. It should be remarked that, according to the Biblical narrative it was Aaron's staff that would turn into a serpent (his brother Moses was also present before the Pharaoh) but undoubtedly in the popular perception Moses is central (see Exodus 7:8–13).

MG – No. I would rather wait for a better explanation than going for a metaphorical reading and, as I said before, there is a possibility of never getting at a physical explanation. There are, however, other interpretations of this verse by some eminent commentators of the Qur'an.

SB – Not even the splitting of the Moon is something we interpret... It happened.

MG – In this case, the majority of the interpreters of the Qur'an relate this verse to a miracle that happened during our Prophet's lifetime. There are, however, some commentators of the Qur'an, like Sheikh M.J. Mughniyah[12] in his Qur'anic commentary entitled *al-Kashif*, who relate this verse to Doomsday. Further scientific discoveries and extended research on Islamic sources can shed more light on this subject.

SB – Do you think that religion can dispense with miracles? In other words, how central are miracles?

MG – I do not think it is important for our time. For me the Qur'an, that is, its contents, is by itself the most important miracle. I do not think that most of the Prophet's followers really became Muslims because of those miracles. But, of course, miracles had an important role at that time in dealing with some unbelievers. For the time being, we have to rely on authentic religious texts and admit the possibility of miracles by prophets and as the religions themselves consider miracles to belong to the past, that is, the time of the prophets, we should rely mainly on the messages of the prophets that affect our present deeds.

SB – You have been compared to a modern Avicenna.[13] I wonder whether you agree with that. But apart from this specific comparison is there any ancient author who influences you and your approach?

MG – [Professor Golshani smiles] No, I am not comparable to this genius at all. As to your second question, we had some scholars in the Islamic world, which had a very expanded view, for example Nasr ad-Din at-Tusi.[14] He was a mathematician and he wrote the best commentary to one of Ibn-Sina's most important philosophical works. Religious scholars consider him to be a top man, and the way he did science is comparable to the best examples we have witnessed in modern times. He was not obedient to anybody but was looking for rationality. So, he has been an exemplary for me. A serious deficiency that I am noticing in our time, and it is always condemned in the Qur'an, is the

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[12] Shaykh Muhammad Jawad Mughniyah (1904–1979), Lebanese jurisprudent. He authored important books on jurisprudence and a well-known commentary on the Qur'an, entitled *al-Kashif*.

[13] Abu Ali Al-Husayn ibn Abd Allah Ibn Sina (Afshana near Bukhara, present-day Uzbekistan, c. 980 – Hamadan, present-day Iran, 1037), known as Ibn Sina or by his Latinized name Avicenna; Persian polymath, most famous for *The Book of Healing*, a vast philosophical and scientific encyclopaedia. The comparison between him and Golshani I refer to occurs in Nidhal Guessoum's *Islam's Quantum Question* (Guessoum 2011, 96).

[14] Khawaja Muhammad ibn Muhammad ibn Hasan Tusi (Tus, Khorasan, 1201 – Baghdad, 1274), also known as Nasir Al-Din Al-Tusi, Persian polymath.

acceptance or denial of something without reason, without argument, simply following one's fathers and grandfathers or some authorities blindly (2:170). They simply accept so and so just because, for instance, Einstein has said that. Of course, there are very eminent people who are always critical and looking for evidence but a lot of things are accepted on the basis of what some celebrities said. At-Tusi was not that way. He has been, I think, a good example for me.

SB – Are you satisfied with the way in which natural sciences are taught in Muslim countries?

MG – No. I have always been critical of that. I think they have to do original science themselves, not rejecting anything without rationality, of course. They have to acquire everything from anywhere, rationalize it and understand it in a critical way. They are not doing it in this way now. They are following the West more or less blindly. Of course, I am not saying that everybody does this. There are some eminent people, here and there, but that is not the general trend.

SB – Do you think that young people – in Iran and in Muslim societies in general – are interested enough in natural sciences...?

MG – Yes. In Iran the answer is a definite yes. We are getting some of the best students in physics or in mathematics. Of course, the market for engineering is the hottest, but that does not mean that we do not get geniuses in sciences. Engineering is quite popular because of the income and prestige of the profession in the society, but there is a lot of attraction for science too.

SB – So you are satisfied...

MG – I am talking about Iran. I cannot judge other Muslim countries. In some other countries it is much less, it is weaker. In countries like Turkey it is good and in Egypt it is good. But in some of the others, it's not that good.

SB – Does your outlook, your philosophical approach, influence your way of teaching?

MG – Definitely. My teaching in physics has always been within a philosophical context. Of course, it is not only limited to physics. Rather, I am thinking in a wider context. I say, for example that this is deficient, from a philosophical view. If you accept it as a tool, it is OK, but this is not the last word. This has to be explained through a more inclusive or understandable theory. I am always doing this.

SB – So your students can really feel your philosophical approach.

MG – Yes, definitely. It has had a very sensible and visible effect. I have noticed it.

SB – According to a well-known narrative, Galileo Galilei (1564–1642) was processed by the Inquisition for his defence of heliocentrism. This is of course a somewhat simplified account of the historical facts, which can be

read at different levels, but it has become a symbol of the possible clash of science and religion. Do you think that, somehow, there cannot be – and there could not be – a Galilei case in the Muslim world? And how?

MG – We don't have an example really. It can happen in those places that have a very restricted theology. But within the wider theology or within philosophical thought, it couldn't, and we have not had an example of that. In fact, I think the trial of Galileo was a big mistake. Ptolemy's geocentric astronomical model, with which Galileo's views clashed, was not part of the Bible. It was adopted. The view of Copernicus could explain things easier. They should have tolerated Galileo.

SB – You have once quoted John Paul II saying 'science can purify religion from error and superstition'.[15] How do you define superstition?

MG – Superstition becomes relevant when you are replacing fictitious causes for some real ones – you try to use unscientific ways to explain natural phenomena. In other words, you cannot understand them through regular science and genuine religious texts don't justify them. Of course, this has entered all religions.

SB – Do you have a specific example of that, some kind of superstition that has been disposed of by science?

MG – For example they say that the number 13 has such and such properties. We do not believe that, and we explicitly say that this is not right in our tradition. But even in this country there are people who are sensitive to it. This is the kind of thing that you cannot find any basis for, either in a religious text or in scientific ones.

SB – In your book *Can Science Dispense with Religion?* you list Darwinism amongst the facts, which originated scientism. You list Darwinism as a danger, so to speak. What is your judgement on Darwin's figure and work? And about Darwinism in general, the theory of evolution?

MG – There is a lot of confusion about Darwinism. I think that this is the most poorly understood theory, as far as I can understand. They are mixing many things with each other. I think it has been better analysed in the Islamic world – at least by a handful of scholars – than in the Western world. You see, Darwin said that there could be a succession of species. There is nothing in our understanding of the Qur'an by which you can reject that claim with certainty. I am not saying that it is definitely true, but I am saying that there is nothing that can reject it conclusively. In fact about 40 years after Darwin's book, a Persian scholar wrote a book in which he admitted that there could be a succession of species. The problem with Darwinism was that a lot of Darwinian evolutionists came after him, which added a lot of metaphysical baggage to Darwinism, making it a base for their atheism, denying any purpose at work and excluding any role for God in the universe. It is for that

[15] Golshani 2001, 134.

reason that in all polls taken regarding scientists' belief in God, the biologists rank among the lowest.

Another point that bothers me is that biologists talk about their findings too confidently, leaving aside other possibilities. As Charles Townes, the Nobel Laureate in physics, said in Berkeley (in 1998): biologists haven't hit the brick wall the way that physicists have. In other words, in physics we have learned that we cannot say so confidently 'this is the last word' etc. But they are saying it.

On the other hand, I think the so-called creationists and the proponents of intelligent design have not always fought the evolutionists properly. Of course, I believe that the whole created universe has a purpose and it had an intelligent design by God but I would not look for the God of the gaps.[16] Similarly, I do not believe that one can infer from the holy texts that the world was created 6,000 years ago. So these kinds of things brought about the confrontation.

Furthermore, the evolutionists are insisting that they are not mixing any philosophy or metaphysics with their science. Evolution is taken directly from the empirical data. But, in a lecture delivered in Washington several years ago, Michael Ruse,[17] an eminent philosopher of biology and an evolutionist, admitted that evolutionism is based on naturalism, which is a metaphysical thesis. After this lecture his friends criticized him. His response was that he is still an evolutionist, but what he had said was a fact. Similarly, when the Nobel Prize in Medicine was given to two researchers for their involvement in the discovery of MRI,[18] Michael Ruse criticized the Nobel committee for not giving the prize to the professor of those two researchers, who was the real inventor, just because he was a creationist. So, as far as the theory of evolution is concerned, I think people have to work seriously on its scientific basis and to listen to the criticisms and be open-minded, rather than suppressing every kind of criticism. Because as far as I can see a lot of things that they mix with evolution are not really part of the science proper, they are part of the added metaphysical baggage, not provable by science *per se*. They are adding them to derive their desired results.

SB – So, if I summarize correctly your point of view, evolution can be embraced compatibly with Islam – and you think that Darwin was misunderstood.

MG – Yes. Darwin calls himself an agnostic. It was Huxley, his student, who really pushed the matter too far and exceeded his limits.

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[16] 'God of the gaps': the expression here means invoking the concept of God in order to explain an unknown phenomenon.

[17] Michael Ruse (b. 1940), British philosopher of biology. He especially takes a stance against the extremes of both creationism and 'new atheism'.

[18] MRI: Magnetic Resonance Imaging, a medical imaging technique used in radiology to visualize internal body structures, for whose development the U.S.-American Paul C. Lauterbur (1929–2007) and the British physicist Sir Peter Mansfield (b. 1933) were awarded the Nobel Prize in Medicine in 2003, although the U.S.-American-Armenian Raymond Vahan Damadian (b. 1936) claimed to be its originator as well.

SB – In light of your specific expertise in your books you also touch upon the philosophical relevance of quantum physics. Could you please explain, in terms accessible to a layperson, which interpretation of quantum physics do you advocate, and why, and how does it fit with your views on Islam and science?

MG – Yes. I have spent most of my life after graduation on quantum physics, and I have had many PhD students who have specifically worked on quantum physics. I have spent a lot of time, critically, but not with prejudice, on it. And specifically I have taught the history of quantum physics development from its very beginning. Quantum physics, I think, surpassed its limits, on what it claims. Some of the founders of quantum theory, for instance, Heisenberg, Pauli, Dirac, were in their 20s when they got involved in it. They gathered at two schools, in Göttingen and in Denmark. Their theory explained a lot of empirical data and for that reason the intuitional understanding of the theory was not important for them. It was a good tool and it is still a very good tool. We are teaching it in Iran and in fact I have taught it over the last 40 years. But it's really a tool, because it cannot explain certain important things. It says a particle doesn't have a position until you measure its position. If something goes from here to there you do not say that you do not know its route; you say the route doesn't exist. Once you discover the particle you give it a position. So, it involves strange things. It's for that reason that Schrödinger[19] considered it to be a stupid idea. So quantum physics at the level of explanation is short. I have written a very detailed book on the philosophical implications of quantum theory in Persian. It is interesting that some of the objections raised against the standard interpretation of quantum theory were also raised by some Muslim philosophers independently. For example, in some of the things that quantum physicists did they jumped from an epistemological position to an ontological conclusion – since we cannot measure a path, the path does not exist for the particle.

I think the present quantum theory has to change; it has to be changed or embedded in a more understandable framework that includes general relativity as well. This is essentially what some of the eminent scientists of our time, like Penrose,[20] are saying. So I have objections physically and philosophically. I think the present quantum theory is deficient at the level of explanation. At the level of application, however, it is very successful. But this is explainable. In logic, we have this fact that if the premises are right the conclusion is right. But if the conclusion of a certain number of premises is right, it is not necessary that the premises are right, that is, a conclusion could be right without the premises being right. For example, Heisenberg, Schrödinger, etc. got a formula from the energy levels of the hydrogen atom

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[19] Erwin Rudolf Josef Alexander Schrödinger (1887–1961), Austrian physicist, Nobel Laureate in Physics (1933) one of the founders of quantum mechanics, together with the German Werner Karl Heisenberg (1901–1976), Nobel Prize in Physics in 1932, the Austrian Wolfgang Ernst Pauli (1900–1958), Nobel Prize in Physics in 1945, and the British-Swiss Paul Adrien Maurice Dirac (1902–1984), Nobel Laureate in Physics in 1933, previously mentioned by Golshani.

[20] Roger Penrose (b. 1931), British mathematical physicist and philosopher.

in a way that did not consider any orbit for the electron. Bohr[21] had got the same formula in a causal way by assuming orbits. So the conclusion that the standard quantum theory is the last word is not logical. Because we could have alternatives, as, for example, Böhmian mechanics has shown. Thus, we must be more careful, examine facts and arguments before reaching a definite conclusion. I think quantum physicists have been short on that. For that reason you see some eminent people – although they are a minority – who disagree with the kind of conclusions that Bohr etc. drew. In Italy for instance, Professor Ghirardi in Trieste as well as Professor Selleri in Bari, have been critical of quantum theory. To say the least, I think it is an incomplete theory. If they accept that it is an incomplete theory, even Einstein would agree with them. The problem comes in when you say that it is the last word.

SB – In your book *The Holy Qur'an and the Sciences of Nature* you state that the study of the harmony between Islam and science is one in which 'very little work is done'. This is what you said in 2003. How do you see this after almost one decade?

MG – I think it hasn't been done enough. What I have suggested many times is to look at the common ground between monotheistic religions. This helps one to have a good understanding of the basis of things. I worked on it for a while myself, but since it has to include all of the three monotheistic religions, it has to be enriched in the company of scholars from other monotheistic religions.

SB – There are also scholars who have a background in Islam or in a Muslim society as well as in physics or in natural sciences in general who are very critical towards the idea of a harmony between Islam and science. First and foremost they claim that this kind of theory stems from a sort of inferiority complex of the Muslim world. How do you respond to that?

MG – I think there is harmony between science and religion, but some people try to show this harmony by revealing the scientific miracles of the Qur'an, and this, in my view, is sometimes due to their inferiority complex. But this is certainly not true in the case of many scholars. I am not myself much interested in this area, as I see the progressive character of science.

If there is a discrepancy between science and religion it is mostly due to the fact that some metaphysics have been added to science here and there. This they are neglecting I think. Philosophy is needed as a bridge between science and religion. I think that metaphysics is the best bridge between them. You see, Dr Stenmark[22] has written an article about my work in which he

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[21] Niels Henrik David Bohr (1885–1962), Danish physicist, among the fathers of quantum physics, Nobel Prize in Physics in 1922.

[22] Mikael Stenmark (b. 1962), Professor of Philosophy of Religion at the Department of Theology, Uppsala University. Stenmark engaged in an exchange of ideas with Golshani on the pages of *Theology and Science. In nuce*: Stenmark pointed out that Golshani's defence of metaphysics for science was rather the demonstration of the fact that individual scientists can be influenced by different ideologies. Golshani emphasized in his turn the twofold distinction, apparently neglected by Stenmark, between 'fundamental theories' and 'intermediate theories' while arguing that the former

agrees that modern science has been much influenced by naturalism, and he says that I am right and Plantinga[23] is right, when we are talking about the fact that modern science has been mixed with a lot of metaphysics. His suggestion is that one should not bring one's metaphysics into science. What I said in my response to him in my article in *Theology and Science* was that this is a good suggestion provided all were obedient to it. Furthermore, there are cases in which your decision is going to be in favour of religion or against it. For example, somehow you have to decide between whether there is purpose in nature or there is no purpose in nature. If you are to conclude on the basis of your science that there is no purpose in nature I do not agree with that, as science cannot deny anything with certainty. Scientists can take the position of an agnostic. So, problems arise because metaphysical issues enter into the business.

SB – Do you see any evolution in your own thought? Are there points that you have been reconsidering?

MG – They have become deeper. No basic changes. Finding more and more evidence. I consider myself an open-minded fellow, and my students agree with this claim. Others have to judge. But nothing has come to change my mind in a fundamental way.

SB – And your outlook was the same even when you were a student?

MG – Yes, the reason is that before I went to university I had studied Islamic philosophy, up to a high level. Then, when I went to Berkeley, California, I continued my philosophical studies, especially the Western philosophy. So, philosophy has been with me all the time and I consider myself fortunate to have started with philosophy because that influenced my thinking about physics and science a lot.

SB – So far we have been speaking about a common ground between religions – the three monotheistic religions, at least. But for example in *The Holy Qur'an and the Sciences of Nature* you seem to be talking also about beating the non-Muslim world in scientific progress...[24] Is there any latent tension here?

MG – Well, I did not mean competition in the sense of denying others. What I have been emphasizing all the time is that Muslims have been too lazy. They have to produce innovations themselves. That is all that I meant.

SB – So there is no competitive element?

MG – No, they have to be producers. They are presently only adding footnotes to today's original texts.

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necessarily requires meta-scientific assumptions (see Golshani 2005b; Stenmark 2005a; Stenmark 2005b).

[23] Alvin Carl Plantinga (b. 1932), U.S.-American analytic philosopher.

[24] Cf. Golshani 2003, 29 and 50–59.

SB – But still, you would say that Islam is in a privileged relationship with natural sciences?

MG – I think that among the holy books, there is more emphasis in Islam on the study of nature. If you look in my book *The Holy Qur'an and the Sciences of Nature* I have quoted many verses that encourage the study of various aspects of nature. In the Islamic tradition too, the study of nature was considered to be one of the best kinds of worships.

SB – People also point out the fact that major discoveries, very important discoveries, were made by people who were not believers at all...

MG – That has to be respected. Because, you know, we have the word from our Imam Ali, who says: 'Look at what he says, don't look at who is saying it'. And there is a tradition from the Prophet to 'Seek knowledge by even going to China'.[25] It is obvious that China was not a place to learn religious things. So, the implication is very general. This tradition has been narrated by both Shiite scholars as well as Sunnite scholars.

SB – You have just mentioned Sunnite and Shiite scholars; do you have an intra-religiously integrative outlook?

MG – Yes. Because I see the differences are very minor. I have so many good friends in the Sunni world. I consider them as my brothers, real brothers. I have also some very good Christian friends.

SB – Have you been criticized for this kind of position?

MG – No.

SB – What about faith without science?

MG – It's incomplete.

SB – If we are talking about laymen, a very ordinary person...

MG – These are good people, but you know there is much emphasis in the Qur'an about trying to learn about how things were created and it is said by the Prophet that seeking knowledge is incumbent on all Muslim men and women. But, of course, some people have less capacity than others. So, they have a lower degree of faith.

SB – In your works you emphasize 'useful knowledge', the kind of knowledge that should be pursued... Can you please elaborate on that?

MG – Useful knowledge is the kind of knowledge that can benefit both the individual and the society. It is useful for securing their felicity. In my book I have a long narration from Imam Sadeq[26] that essentially says: Any kind of

[25] A. M. Al-Ghazzali, *Ihya Ulum al-Din* (Beirut: Dar al-Marifah), Vol. 1, p. 14; M.B. Majlisi, *Bihar al-Anwar* (Beirut: Dar Ihya al-Turath al-Arabi, 1403 H.), Vol. 1, 180 [Note by Professor Golshani].

[26] Jafar ibn Muhammad al-Sadiq (Medina, 702–765), Muslim jurist. He is revered as the sixth Imam or leader and spiritual successor to Muhammad by the adherents of Shiite Islam.

knowledge which is harmful shouldn't be taught, and in the case of knowledge from which both harmful and useful effects could result, the useful side should be followed, the harmful should be avoided. Here by useful I mean something that brings people closer to God and leads to the felicity of mankind.

SB – Can you give me an example of useless knowledge?

MG – Magic. It is explicitly said in the Islamic tradition that one should not go after magic.

SB – Are there any examples of scientific practice, which goes against the values of religion, in the contemporary world?

MG – I think some people in physics and in biology – those who work at the theoretical level, sometimes exceed their physical knowledge in claiming certain things. They can't say there is no God. At most, they can say that they have not found God.

SB – But beyond theoretical positions – I am thinking more of concrete practice, like stem cells experimentation, or...

MG – Well, I think this needs some elaboration. I think in this respect both Christianity and Islam have some common views. It has to be studied in detail, considering all of its different aspects, as they did in the U.S. when they started with a multidisciplinary committee after their president's decree to study its various aspects. I think there cannot be a very general statement. It has to be a detailed one – not exceeding some general limits. So, for example in the case of stem cells, when it comes to the case of humanity, they have to go step-by-step in a careful study to make wise decisions. Just trying things, without knowing the by-products, is not advised.

SB – Are you saying that scientists, when it comes to ethical questions, should submit, somehow, to theologians? They have to listen to them?

MG – I think there should be common committees between them, to explain their positions and of course theologians participating in this discussion should be well versed on the scientific side of the matter. Then the decisions are going to be more balanced. This is what they are doing now in some parts of the Islamic world as well as the Christian world. There has to be some Islamic conferences on this matter, involving scholars from all parts of the Islamic world, with the most knowledgeable people participating and arguing between themselves and then deciding. This hasn't been done.

SB – So you are optimistic that under appropriate circumstances, they can agree, they can find a common ground?

MG – Yes, I am very optimistic. But there has to be communication between them. You know, the problem is that there hasn't been much communication between Muslim scholars living in various parts of the world. Between scientists from all parts of the world there has been good communication but

this has not been prevalent among Muslim theologians. I think it should be done. They should listen to what others say.

SB – Don't you think it is a problem that some theologians are not natural scientists?

MG – They should be familiar with it. This is what I have been emphasizing in Iran – that at least a percentage of theologians and jurisprudents have to learn sciences like physics, biology, and so on. This is necessary. And there has to be communication between them. You see, in the conference that was held in Berkeley in 1998, four disciplines participated: cosmology, computer sciences, biology and physics. It was a very useful exchange of ideas. I think a good thing about this age is the facility of communication. Unfortunately most of the time it is not made use of.

SB – In your work you speak about different sources of knowledge. You speak about intuition for example, but you also touch upon mysticism. So do you think there are also other sources of knowledge of God?

MG – Well, there are senses, there is intellection and also intuition and we can get hints from revelations about certain things.

SB – ...So it is not another source...

MG – No, in my book, in my discussion of intuition I have mentioned that it starts from inspiration for the case of a scientist, to revelation at the highest level, as in the case of prophets. Mystics are included in this category.

SB – Do you think that the Qur'an can contain any passages which can be obscure or which so far have not been sufficiently explained?

MG – There are plenty of things, which are not sufficiently explained. But I think that is because our scientific knowledge is incomplete. We are at the beginning. Most of the things we have learned were learned during the nineteenth and especially twentieth century. We are not at the end of science.

With this remark we ended our conversation on Islam and science. We exchanged some more words about the beauty of Iran, and the fascination of Qom, which I would visit next. After heartily thanking him I left the Institute for the Italian Embassy, where I was staying. In my hands I was holding a last gift from the professor: a tin box full of local pastries.

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CHAPTER 3

Paving the Way for the Reformation of Islam

Conversation with Mohammed Basil Altaie

Mohammed Basil Altaie (b. 1952 in Mosul, Iraq) is a Professor of Physics at the University of Yarmouk (Jordan). He obtained his PhD in physics at the University of Manchester. One of the most interesting biographical traits of Professor Altaie is that, despite growing up in a society influenced by Islam, he came to believe in it relatively later, through Sufism. He narrates not only that he began as an atheist but also that his faith came later than his interest in physics.

Altaie complements his competence in physics with his knowledge of *kalam,* or speculative theology, of which he emphasizes the topicality. Some ideas put forth by the *mutakallimun,* according to Altaie, can be seen in harmony with those of contemporary physics. Altaie is critical towards the 'scientific interpretation' of the Qur'an as well; however, he does not reject it as a whole but he rather warns of incompetence and lack of sufficient scientific knowledge which, in his opinion, lead some self-improvised 'scientific exegetes' to produce pseudo-scientific works.

Whereas some of his essays might prove rather dense and technical, and therefore less suitable for the general public, Professor Altaie embarks on a relentless work of popularization through a blog, and through conferences held at his university. Moreover, he has tried to establish a course in scientific ideas for students of Islamic studies at his university.

I met Professor Altaie in Irbid, Jordan, on 18 May 2011, in his office at Yarmouk University. Our conversation extended over many hours and continued over lunch in the university's dining hall as well a stroll through the campus. In his eloquence, Professor Altaie blends calm, clarity and irony. I was fascinated by the number and richness of topics he touched upon and by his capacity to draw examples from our surroundings, such as the smoke of a cigarette, or the door of his office, along with episodes from his own life. It was precisely with his biography that we began.

Stefano Bigliardi – To start with, I would be glad to learn more about your intellectual biography.

Mohammed Basil Altaie – I am of Iraqi origin. I obtained my first degree from the University of Mosul, in Iraq. I obtained my BSc in physics in 1974. I was a distinguished student, as I had already written a book at that time, about the special theory of relativity, including a part on general relativity, a descriptive part, and a part on special relativity fully exposed with all the mathematics needed. The University of Mosul found it suitable for publication. A year later I translated a book from English to Arabic, which

was titled *Particle Physics*, and that was also published before my graduation. So this truly gave me a boost. In addition I also used to write some articles in local journals and magazines. The Iraqi government was eager to encourage the youth – new blood into the educational system. I was awarded a scholarship at that time for studying abroad to obtain a higher degree. I chose to go to the United Kingdom. Soon after my graduation I joined the department of physics at Manchester University and I obtained my PhD by 1978 in the subject of quantum cosmology. My work was to investigate the vacuum energy that might have caused the creation of the universe. I published three papers from my PhD thesis, in the most prestigious journals, two papers in the *Physical Review D* and one in the *Journal of Physics*.

SB – The core of your education and of your profession is physics. When one reads your essays the impression is that trying to understand your thoughts is like having to disentangle a system composed of Chinese boxes: you have physics philosophy, Islam, *kalam*... Can you help us to arrange them in the right order?

MBA – Yes. When I was a secondary school student I was already very interested in the scientific achievements of the Muslims. As you know, as any local person in this area, in Arabia, we are brought up within a climate of our heritage. So, as a schoolboy I tried as much as I could to learn about the Islamic achievements in science, and so I read some non-specialized reviews of the works of Al-Biruni and Ibn al-Haytham.[1] Then I read the works of Averroes,[2] and later – only later – I read Al-Ghazali.[3] In the beginning I thought that Al-Ghazali was so backward that you didn't need to read him, you should read him through Averroes. But later I found that Al-Ghazali has enough originality that qualifies him to be considered scientifically more advanced than Averroes. On the other hand, I had my special love for physics.

SB – So these were the most influential figures within the field of philosophy. What about physics?

MBA – In the field of physics the most influential personality I think was Albert Einstein. Sometimes, I think, because of the similarity between his face and that of my father, I thought that Einstein was my father [Professor Altaie smiles slightly]. That's why I wrote the book about relativity when I was only 20 years old.

SB – Was this a personal interest or were those authors part of the curricula at that time?

MBA – Both. They were part of the curricula, and also there was an environmental influence.

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[1] Ibn al-Haitam (Latin Alhazen; Basra, 965 – Cairo, 1040), scientist and polymath (the definition as 'Arab' or 'Persian' proves somewhat controversial).

[2] Averroes (Cordoba, 1126 – Marrakesh, 1198), Andalusian philosopher and polymath.

[3] Al-Ghazali (Tus, 1058–1111), Persian theologian, jurist and philosopher.

SB – So from the very beginning you were interested in physics and philosophy at the same time. Was the interest in religion also there from the very beginning?

MBA – I was not so religious actually. I started my life as an atheist. And then I became more interested in Sufism. I went deep into Sufism, including the personal experience, and this was during the years of my undergraduate studies. I read about Sufism, I practised Sufism, and joined a group of Sufis and attended their ceremonies and rituals.

SB – This in the UK?

MBA – No, it was in Iraq, before 1974. And then, when I went to the UK, I started my real critical thinking and my philosophical interest grew. During my time in the UK I faced a new world, a new culture. After completing my PhD in science there was the opportunity to get a PhD in the history and philosophy of science, which was very appealing to me. However I declined the offer because I was committed to return to Iraq as soon as I finished my physics degree. I went back to Iraq in September 1978.

SB – Would you say that Sufism was the major break in your intellectual development?

MBA – Yes, it was actually an experience that I wanted to gain, and I believe that it was a true experience. I believe that Sufi practice is just another world.

SB – What had brought you to Sufism, since you were an atheist?

MBA – In my early university years when I was an atheist, what brought me to it was actually my readings of the original texts of Sufis rather than deciding offhand, blindly, that religion is a bad thing, that religion doesn't comply with science, that religion is something from the Dark Ages. During my studies in the UK I had some spare time while writing my thesis. By then I was fed up with tensor calculus and mathematics, so I opted to read something completely different, so I began to study the Old Testament first, and then parts of the New Testament, and then the Qur'an. I read these texts for personal study as opposed to for religious purposes, and I wanted to see what meanings were contained in these books. I found that these three books are actually from the same source, a divine source if you like. It is one teacher who is teaching the doctrines of monotheism.

SB – Do you think that the word 'conversion' is appropriate to describe your experience?

MBA – I wouldn't say it is a conversion. It should rather be described as changing attention, or an awakening, because I found that my atheistic approach was based on a lot of ignorance. But once I had the broader view of the world I became enlightened and saw the facts in a wider context.

SB – And what about other developments in your thought: have you noticed that you have changed your mind about other points?

MBA – Science has provided me with an open-minded approach to everything. One example of this was my re-reading of Al-Ghazali again many years after my initial reading of him during my university days through others like Ibn-Rushd. I read *The Incoherence of the Incoherence* without having read *The Incoherence of the Philosophers*. I had said to myself 'It is already here, why should I read Al-Ghazali?' However, later I found that I should read the original text as opposed to secondary sources. There are many common misunderstandings in philosophy. For example, the Mutazilites[4] are always presented as leaders of liberal thinking, and the Asharites are publicized as backward and followers of dogma. But if you go to the original writings you find that with regard to questions of natural philosophy both the Mutazilites and the Asharites have nearly identical views. They differ only regarding the question of man's acts. Whereas Mutazilites consider man to be the creator of his acts and therefore directly responsible for them, the Asharites consider God to be the creator of all acts and man is only acquiring the results of his acts, thus he is not responsible for them. This theory of the Asharites was called the theory of 'acquisition'.

SB – What is the impact of philosophy and of religion today on your teaching? Can your students perceive it?

MBA – I can tell you confidently that in this department I am one of the most interested in the philosophical aspects of physics. My students love my public lectures – scientific and non-scientific. We have a little forum nearby the university, where about once a month I deliver a lecture, or a talk, and these always generate a great deal of interest among students as well as the public. However, I would state that the general public is much less interested in science than in Europe – I do not have exact statistics but it would be worth investigating this.

SB – You have the insider's view of a former atheist. What do you think of religion without science and of science without religion?

MBA – I couldn't find an answer better than that of Albert Einstein when he says that religion without science is blind and science without religion is lame. In general, this is my understanding; but when it comes to Islam there are more details to talk about.

SB – What do you think of the faith of ordinary people, of laypeople? Faith without science. Is it incomplete in some way, or are you mainly referring to yourself, maybe, to the fact that in your case you cannot conceive religion without science?

MBA – Now we come to the details. Religion, in my opinion, is comprehended on two main levels. Level one is where religion is understood through belief and dogma. This is believing in God, believing that this

[4] Mutazilites: adherents of the theological school known as Mutazila, flourished in Basra in the eighth to tenth century. Mutazilites held that the Qur'an was created (not co-eternal with God) and upheld the use and supremacy of reason in theological matters.

universe has a purpose and believing in some kind of a life after death. This kind of comprehension is more psychological than rational. It suits laypeople. The second level is the comprehension of religion through the understanding of the basis of Islamic creed through rational enquiry. This approach takes the facts of nature and our existence as signs for believing in a purpose for this universe and for our existence as intelligent beings. Here we need to operate our rationality and I admit it is not an easy task. In fact I feel that the discovery of modern science (and mathematics in particular) has enhanced our belief in a purpose for the universe and for our life contrary to what some other people may conclude. This logic behind the relations in the physical world, this logical hierarchy is surely pointing to a purpose. I don't mean to say here that you can prove the existence of God by mathematical equations. Such a belief is irrational, but then we come to what we call *iman*, believing in depth. Islam means accepting that God exists, that the Prophet is a messenger of God, the Qur'an is the word of God, and you have to abide by all the rituals and requirements of religion including you life style. But when it comes to *iman*, the deep belief in God, in the purpose of the universe, you have to do some research and make an open enquiry. Without research, without thinking, contemplations, you cannot reach the truth. So Islam is accepting the belief as a rule of thumb, taking it for granted, as such. But *iman* is something much deeper.

SB – You know that you are not alone in this intellectual enterprise. There are also other scientists, who have a deep understanding of Muslim culture and of Islam, who are engaged in this field. Do you feel that you are part of an enterprise, and what is special about your theory?

MBA – I do believe I am part of an enterprise, but unfortunately I have to admit that there isn't much cooperation between us.

SB – Is it for practical reasons or because there is something very different about your views, which you cannot reconcile?

MBA – I think that basically there is no programme gathering these people and their ideas into one congregation. On the other hand we also have some different views; for example Dr Nidhal Guessoum, as far as I understand, has a completely different opinion on Al-Ghazali and the heritage of *mutakallimun*. Unless you read Al-Ghazali in his original texts, you cannot judge whether this scholar is genuine or whether he is a backward person living in the Dark Ages. Al-Ghazali, in my opinion, is much more advanced than Averroes. I should say from the beginning that I have my own programme for science and religion – and Islam. And I find my references in the works of the *mutakallimun*. The *mutakallimun* were rationalists, people who thought about nature and science, but unfortunately they were misled into considering the theological questions early, when they started their works. They should have stuck to discussions about nature, space, time, and matter; they would have achieved much better works. Unfortunately they went to the theological part and started discussing the attributes of God, and through that they went into the mud of religious creed and there they had

their fights with the *fuqaha*[5] and among themselves that eventually caused their elimination.

Regarding cooperation with other scholars, there is no reason why I should not be able to – and I have never said that I do not want to – cooperate. I am in fact open to any collaboration on the topics I deal with. But as far as the agenda is concerned, then I do have a programme of re-establishing *kalam* in our modern time. I have already written a book on *daqiq al-kalam*, which I consider to stand for the Islamic philosophy of nature. But then this has to be complemented by *jaleel al-kalam* that deals with God, man and the society. When I say I couldn't find serious critiques I mean that nobody has given me provocative feedback from the Arabic readership. However, the story might have been different should the work be published in English.

SB – Let us focus on some other contemporary, albeit less recent, authors. I am sure that you are also familiar with the names of Nasr, Sardar, al-Faruqi and Bucaille. What is your stance towards their ideas or outlook on Islam and science?

MBA – It's good to mention the names, because one can differentiate between the different themes or trends in this area.

As far as I can figure, the approach of Seyyed Hussein Nasr is much affected by mysticism, maybe a special type of mystic interpretation of the universe and man. He has, in my opinion, some original contribution in this area, but again, when you want to delve into what he wants to say, you end up with a mostly metaphysical, non-factual world. You are soon pushed into an area, which is far from the physical world. As to Sardar, I am not very much familiar with him, although I read his book. As for al-Faruqi, I know his approach, including the whole trend of the Islamization of knowledge. My critique about it is that such thinkers and authors have very beautiful targets, but unfortunately, they lack the foundations, they don't have the methodology to do that. They have no clear basis as far as I can see. Wishful thinking does not help in such a case.

SB – So you say that it is not enough, not that it is wrong.

MBA – It is not enough, because it is unfounded. You need to have an underlying philosophy. You need infrastructure from which the results come from. I give you an example, Marxism. It has an upper structure, which is the economy, politics and society, but it has its own infrastructure as well which is based on the materialistic philosophy. The world-view of the Marxists is based on the materialistic philosophy. If you take Hegel, on the other hand, you see that he has based his views on his idealistic understanding of the role of rationality in the world, and the prime rationale, which is the essence of the world, the mind of God, playing in the world. The trend of al-Faruqi has no basis, no rails to run on. For this reason I see no future for this project of the Islamization of knowledge being carried according to the IIIT approach.

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[5] Plural of *faqih*: experts in *fiqh*, Islamic jurisprudence.

SB – So you would say, if I interpret you correctly, that this is a weak philosophy.

MBA – In my opinion it is.

SB – What about the approach of Maurice Bucaille? He's probably the most celebrated name in the trends of the scientific interpretation of the Qur'an, which has also some advocates who are nowadays very active, for example Professor El-Naggar, or the Turkish author Harun Yahya. What do you think of this trend?

MBA – We should make a differentiation between al-Faruqi, including the IIIT group, and Harun Yahya or El-Naggar's trends. Whereas the first group would like to Islamize the scientific research and the scientific endeavour in general in every aspect including social sciences, El-Naggar and Bucaille have a more superficial approach. They are looking to interpret the Qur'an in a way that says it contains scientific ideas about the world, man, society, and one should work to exhibit that. Here, you have problems. I have written an article criticizing El-Naggar's articles and all similar trends. It was a short article, published in the local paper *Al-Rai*, in which I have shown that some claims of El-Naggar are not verifiable, some other claims are false and some others are correct if interpreted in a given context. I find that you cannot conclude an important result from the Qur'an unless you are wealthy enough in that specialization you are dealing with, otherwise people might discover that you do not know what you are talking about. I find that sometimes El-Naggar makes scientific mistakes when he talks about cosmology. I cannot talk about geology and oceanography. I cannot talk about medicine and the stages of embryonic developments, but I can talk perfectly well in the field of cosmology, astrophysics and astronomy. So I have to stick to my own specialization otherwise I might sometimes have absurd explanations or faulty presentations of scientific facts, or Qur'anic facts. The Qur'an should be taken as one whole. I mean that you should consider whatever the concept or term you are discussing through all the verses in which it comes and not just single out those that are in conformity with your goals. For example, in a recent study of the terms 'heaven' and 'heavens' in the Qur'an I found that there is no way to give a single meaning since the term 'heaven' has so many meanings that it makes it impossible to be interpreted unless analysed in the context in which it comes.

SB – I remember you saying that the term is obscure.

MBA – Yes indeed, the term 'heavens' in the Qur'an is quite obscure. This, in my opinion, is caused by the fact that the holy text expressing the absolute knowledge of the divine in Arabic has been formulated as such so it would be open to the development of the concept according to our knowledge. It is simply impossible to express all the knowledge of the divine in a mortal language.

SB – If I interpret you correctly, your judgement on this trend is not completely positive but not completely negative either.

MBA – Yes, I cannot say that I am completely negative about it.

SB – Would you say that such authors are basically sincere, they can make mistakes, but you don't totally reject their works?

MBA – That's right, they need to correct their approach. Although I feel that the Qur'an contains scientific signs, but these signs are not scientific theories, and they are not scientifically detailed explanations. These signs certainly attract our attention. I give you one example, one important example, which is the question of the expansion of the universe. It is true that the Qur'an mentions that the heaven is expanding: 'We have made the heavens with Our hands and We are expanding it' (51:47). The verb expanding means 'we are making it larger'; if you go to the translations, different translations, you will get the same meaning that it is getting bigger. True, but then it says in one verse that the heavens will be rolled up, like a scroll. This is clearly stated in sura al-Anbiya': ('This will happen) on the day when We roll up the heavens as if it were a written scroll and bring it back into existence just as though We had created it for the first time. This is what We have promised and We have always been true to Our promise' (21:104). But present cosmological observations seem to indicate that the universe will go on expanding forever. So, how can we reconcile these two positions? The universe in the Qur'an has a fate, and the fate apparently is in accordance with what we the cosmologists call the closed model in which the universe expands from a point size, reaches a maximum radius and then collapses to the point similar to where it began. But present science says that the universe expands and will continue expanding forever, there is no big crunch.

SB – Then how do you interpret the Qur'anic verse?

MBA – Here, in my opinion, you have to do some genuine research, as I have done already in order to resolve the contradiction. If you cannot resolve the contradiction, then you have to admit that the Qur'an has a different prediction from that of science. This is the way in my opinion to deal with the contradictions between science and the Qur'an and, as you see, this approach is scientifically motivating and research inspiring. But such works have to be done with complete neutrality and originality, no matter what result you may obtain. But since science is changing we cannot consider this conflict between science and the Qur'an as a disproof of the Qur'an, for we may discover one day that the universe will collapse. What science is saying about the fate of the universe today is not the final answer. In order to resolve this apparent contradiction I have asked one of my postgraduate students to investigate the possibility of a flat universe with a non-zero cosmological constant moving towards collapse. This was done now and we have found that for a specific value of the cosmological constant a flat universe might collapse, turning into what we call an oscillating universe. Therefore, the possibility for collapse is there and since we have no fixed value for the cosmological the possibility cannot be ruled out. Of course there remains the other problem of investigating the cosmic microwave background signature of

such a universe and comparing it with observations. We should do this too to get a viable model, which agrees with the Qur'an.

The other part is the development of the human being. Whereas Harun Yahya is making efforts to disprove the theory of evolution, I do not know how he couldn't gather the idea that the Qur'an itself in many verses supports the notion of evolution. Perhaps the Qur'an wouldn't agree with the Darwinian picture of evolution, I mean the random mutation followed by natural selection, which are the two pillars of Darwin's theory of evolution. The Qur'an would not agree with that, certainly. But the Qur'an is not against the idea that there could be biological evolution. In this respect I have written an article in Arabic, where I have brought all the verses from the Qur'an dealing with the question of evolution, the development of humans, and I have found that there are strong signs telling us that human beings evolved a long time ago from the mud to this state, and the moment at which the developed creature became human is a special moment in the history of the living creatures. At that moment human beings acquired their identity by becoming intelligent. This could have happened through genetic mutation but for me it was done for a purpose rather than by blind chance. In a comment on Dawkins' *The Blind Watchmaker*[6] I will say: If a blind person can make a watch then certainly he is not blind. Can't Richard Dawkins see that? In fact, this marks the difference between us and the animals, including the apes. The Qur'an states that clearly. It states that we have been given a mind to wonder and question our existence, the world and the logic behind it. So in short I believe in biological evolution but not necessarily according to the Darwinian Paradigm. Why shouldn't Harun Yahya and the others who are against evolution not consider such facts, such verses, and interpret them correctly?

SB – Speaking of publishing strategies, one advantage of the works of El-Naggar or Harun Yahya is that they reach a very wide readership. What about your readership? What is your target, what kind of readers are you writing for?

MBA – Well, as I told you, I have a programme. It is so extensive that it covers nearly all areas of interest in science and religion, including divine action, and the question of intelligent design...etc. I try to base my conclusions on a well-founded strategy, and that strategy is in science and the rational contemplation of the world. This is the difference. I feel that natural sciences have a wealth of information that can inform us. But on the question of readership I should admit that people here do like to read simple descriptive literature and this is much preferred compared to serious thought-provoking books or articles. People here prefer the narrative presentations, and this is why the styles of El-Naggar, Amro Khalid, Omar Abdul Kafi, Ratib Al-Nabulsi and similar preachers are much preferred. On the other hand, this trend of narrative shallow teaching is supported by the media,

[6] Richard Dawkins (b. 1941), English ethologist and biologist, mostly known for his defence of atheism in which the endorsement of evolutionary biology plays a major role. See Dawkins 1986.

which earn them publicity. However, I feel if the floor is given to more serious thought-provoking presentations then people will surely interact with them. For example, discussing issues in science and religion like the question of biological evolution is completely unwelcome here as this will be considered a deviation from the traditional religious understanding, even if you would like to challenge detailed thoughts such as those proposed by Richard Dawkins.

SB – Well, you know that this is a big challenge because, the abstraction being made from the content of his lectures, with which you can agree or disagree, Dawkins is beyond any doubt a great communicator!

MBA – He is a great communicator, no doubt. But my argument is very simple, it is based on some important and fundamental remarks; these are: first the laws of nature cannot stand alone. Some agency has to drive these laws in accordance with the algorithm they describe. Second, the laws of nature need to be coordinated for a fruitful result to be achieved. This immediately imposes the need for an external agency beyond the capacity of the universe in order to provide such a service. Third, quantum mechanics has shown that results of the action of natural laws is indeterministic, therefore the universe in part or as a whole must be contingent. Fourth, quantum mechanics has shown that causal relations are only true as much as these relations describe the chronological order of events, the cause and effect relationship, but not necessarily the actual reason for the events. Therefore, the classical naturalistic reality is challenged by modern science. One has to take this into consideration. In theological terms this might be expressed by saying that God is the sustainer of the universe, God is assumed to intervene in the universe one part in ten to the power 44 seconds, or even less than that. So, even the mutations in cells are done according to the will of God. But the will of God is so designed, apparently, as to follow certain algorithms, that is to say, certain laws, which we call the laws of nature. These laws reflect causality on the macroscopic level, but on the microscopic level you find God playing with probabilities and values to construct this world to be something other than nothing.

Paul Davies[7] has already mentioned something like this in his book *The Accidental Universe*. He says that if you go into the details, the basic foundations of physics, chemistry and biology, you conclude that some intelligent force may have played with the probabilities so as to make the universe possible. So who is playing with the probabilities? If you go to any physicist, any quantum physicist, and ask him 'Are the results of your measurements in the lab, on the atomic scale, deterministic or indeterministic?' he would immediately say indeterministic, because the microscopic world is completely indeterministic. We do have Schrödinger equations, we have the Dirac equations, but you cannot be sure, a 100 per cent sure, that the result in the lab will be according to what you are expecting. That's why, when we talk about measurements, we talk about

[7] Paul Davies (London, 1946), British physicist and author. See Davies 1982.

actual measured values and not the theoretically expected values. The difference between the two is attributed to the uncertainty principle, which seems to be at work everywhere. This problem is called the problem of measurement in quantum mechanics. We should realize that God does not rule this world miraculously but according to well-defined laws. This is what the Qur'an refers to as the 'just creation'.

SB – It looks like your essays in general are very technical. The usage of technicalities may result in the fact that you reach a smaller audience.

MBA – That's right. I should admit that my readership is very small, maybe because of these technicalities. But mind you, I find my thoughts very effective among the intellects that in turn are talking to lower level people like students in schools. That is why I get many invitations to give public talks.

SB – What is your stance towards other religions? Or at least towards other monotheistic religions?

MBA – Unfortunately most of my writings are in Arabic, but if you read my English articles, you will find that sometimes I am not addressing only Muslims. When I think of reconciling science and religion I always think in terms of universality of the monotheistic religions. That is to say my goal is to provide the reasons why I am a believer and not an atheist, and why the proper understanding of religion is useful to man and society. In this I can't see a difference between a Jew, a Christian or a Muslim. They are all in the same boat. In fact I feel we should educate people to realize that the most important goal is to expose the benefits of being a believer, no matter what religion you belong to. I mean this on the popular level. On the intellectual level, the laws and regulations enforced by religious scriptures, if properly understood, can very much help in organizing the society by contributing to the development of a proper justice system and construction of a proper view of the world.

SB – Do you emphasize that Islam is the completion of the Christian message?

MBA – Indeed. Originally, Islam was meant to be the complement and the salvation for all predecessors, for Judaism and Christianity. However, during the past ages since Muhammad preached the Qur'an much water has gone under the bridge. During the past 1,400 years many thoughts were introduced to the body of Islam, which has certainly deformed the original picture. Something similar had already happened to Christianity and Judaism. The time when Christianity was practised in secrecy has contributed to the distortion of the facts. This is why we have several copies of the New Testament. Islamic thought, I feel, is now in need of reformation. Much of the distorted picture of Islam is the result of the wrong interpretations of the Qur'an and the strong emphasis on *hadith*, the narration of the Prophet. For this reason, you see that we have many factions or groups who have more or less different Islamic versions of the *sharia*. We have the Sunni Muslims and the Shiite Muslims and within each of these you find several factions. Within

the Sunni version we have at least four factions. When you are prevented from practising your religion, many different interpretations will appear. This for example has caused lots of distortions in the Islamic thought of such groups who may have suffered from this experience. But the important thing is that the holy book of Islam, the Qur'an, is well preserved since the time of Muhammad. Therefore, in Islam we have the original reference living with us and we can consult it at any time. This way I feel we can rectify Islam from whatever inferior understanding that might have slipped into Islamic thought.

SB – If I interpret you correctly, there are all these differences that also result, practically, in different sects but, if we are rational, if we interpret them in the right context, we can set up an interfaith dialogue and understand each other.

MBA – Yes. If we set up a proper methodology to draw the correct meaning of the texts we will certainly draw the right conclusions. Interfaith dialogue is certainly possible and could be quite successful once the right people are sitting around the table.

SB – Is the distinction between Sunnite and Shiite Muslims relevant for you?

MBA – This has something to do with religious beliefs, and the religious jurisprudence. I have discussed this question in one short article on the basic difference between Shiite and Sunni.

SB – I mean, when you write you address a general Muslim readership – you do not make any distinction?

MBA – Oh yes, a Muslim readership, definitely. Indeed, I do not make a distinction at all.

SB – Speaking of Muslim countries, are you satisfied with the status of science and of scientific education nowadays? Education and implementation, but also interest on the part of the general public?

MBA – Well, I should admit that I don't have much admiration for education in the Islamic world. The basic reason why I am not very optimistic is that we are now in the twenty-first century and we are still inhibiting and preventing critical thinking. We are not training our students. On all levels, from the very basic level to the university, or even PhD level, we are planting one-way thinking. You may be surprised but we don't encourage critical thinking. We encourage what you may call the traditional rule of thumb: 'You should take and believe in this and that...' Unfortunately I feel sometimes, when I deliver my lectures, that I have to be conservative, somehow, otherwise the public may cause problems. They may accuse me of being an atheist for example, while I am a genuine believer. If you depart a little bit from the basic doctrines they have been told, then it's a red flag.

SB – So the main point about your being dissatisfied is the lack of critical thinking.

MBA – This is the most basic point. Everything else will come later, because the content can be amended easily. The point is the education: how to bring up children, how to build up the mature attitude about nature and reason. Unfortunately they have no idea of critical thinking at all.

SB – This is very interesting, because you are not mentioning material resources. You are not telling me that scientific education is lacking money or instruments...

MBA – Once you bring two things: critical thinking and true democracy (if we can borrow this from, say, the West, and amend it, because Western democracy needs amendments to be practised in our part of the world), if you bring these two things, everything else can be arranged. Money-wise we are wealthy countries, (mostly, perhaps Jordan is not to be counted as such), we have the Gulf States, Saudi Arabia, Iraq – even Egypt is a wealthy country. If true democracy would be in practice, the people can find solutions to their problems – social problems, religious, whatever. Look at this problem of the Copts and the Muslims in Egypt. I feel ashamed. We are in the twenty-first century and we are quarrelling about religious matters. The Copts have been living peacefully in Egypt for hundreds of years. Again, it's the dogmatic mentality that is so underdeveloped.

SB – ...And have you been criticized for such views, if you have expressed them in public?

MBA – Yes. But not much about my behaviour. As I said, I receive from time to time e-mails praising me for my intellectuality. They say, 'You are a great scientist and an admirable Muslim intellectual, but on the other hand we find that your family is not abiding by the Islamic rules'. My family is doing nothing actually, other than the moderate Muslim behaviour, they are reasonably conservative, but they don't wear the *hijab*. I don't believe in the *hijab* but I don't force my family not to wear it. If one of my daughters would wear the *hijab*, I wouldn't force her to stop. They are free to choose their way of living, but I always ask them to be respectable.

SB – So is there a special reason why you prefer nevertheless to teach here in a Muslim country? Do you feel part of an enterprise aimed at improving teaching and knowledge?

MBA – Well you can say, until a few years ago I had that idea. But to be frank I should admit that I am somewhat disappointed, and I don't mind going anywhere now to work, to teach people, even among Buddhists or Hindus. This is because I believe that religion, interpreted in the proper way – in conformity with science – will be useful to anybody, to any society on Earth. I am one of the believers that science cannot provide us with morals. I still believe that religion is an organizer for the society, including science and trade. This is how I see the Islamic role in the Islamization of science; it is in organizing scientific research. It is in directing or encouraging certain trends in industrial design. For example, if you want to build a car according to the Islamic perspectives, you will see very few colours, very little luxury, but you

will see the most efficient functioning systems. You will not see some parts being manufactured to wear out quickly for commercial reasons, but you may see some parts being manufactured with less quality for the money. It is a matter of cost-effectiveness.

SB – You mean that religion also provides a guide for very concrete matters, like manufacturing a car?

MBA – Indeed. In my opinion, yes, religion can provide you with directions, but never the details. That's left up to you.

SB – We spoke about education. What do you think of philosophical education? Do you think that the rich Muslim tradition is taught enough? Are the students aware enough of this heritage?

MBA – In philosophy the case is even worse, because philosophy is hardly taught to science, engineering or medical students. Not even as an elective course.

SB – Are you referring to Jordan now or to Muslim countries?

MBA – I mean in Muslim countries in general. Perhaps Jordan is the best case. They were teaching philosophy in secondary school. I am not sure whether they are still doing so. But generally the interest in philosophy now is very limited. In my opinion philosophy is very important for fostering critical thinking. It's important for all levels, including university. The students should have some philosophy classes.

SB – How does one read the Qur'an with a physicist's mind-set? For example, when the Qur'an relates narratives regarding supernatural events?

Let's also take very specific examples, my favourite ones being that of the splitting Moon or, in Christian sacred texts, water turning into wine, or Moses' staff turning into a snake – a miracle you can find in the Old Testament and in Islam alike. How does Altaie the physicist react to that? We can discuss miracles as a whole topic or we can discuss single narratives separately, as you like.

MBA – Yes. This is perhaps the biggest dilemma facing the science and religion debate and perhaps it may be considered the weakest point where religion cannot provide enough evidence that miracles exist at all. But I believe that miracles do exist. But only because they are very rare, they need to be rare, actually, because miracles in essence only stem from the probabilistic nature of the physical world. Scientifically the probability of a miracle is very low. This is the reason why it is a rare event.

I'll give you a clearer and specific example. If you shoot this wooden door with a gun then everybody will expect that the bullet will go through the door easily, no doubt. But this is only true classically. If you go deeper into the laws of physics you discover that there is a non-zero probability that the bullet, one of the bullets out of a billion, may get reflected off the door. This is what quantum mechanics tells us.

SB – [Laughing] Do you mean that if I try a billion times, I can go through the door without opening it?

MBA – Exactly. Now here we have a miracle, do we not? According to our understanding of everyday life, this is a miracle. If I hit the door a few times and all of a sudden I am in the corridor without opening the door, this is a miracle, isn't it? There is a non-zero probability. It might be ten to the power minus 60 that you have to hit yourself so many times, not necessarily violently and you will go through... Is this happening at all in the real world? It is. In the microscopic world, inside the nucleus, some parts of the nucleus escape the field of the nucleus despite the fact that the energy barrier is higher than the energy of these particles, but they escape. In classical physics terms it is a miraculous event. It is exactly the same as if you are locked in this room and you go to the corridor without opening the door.

SB – But still, we are talking about events that can be included in the concept of a miracle, but micro-miracles, so to speak... What about macro-miracles?

MBA – Yes, the macro-miracles are very rare events. Micro-miracles are happening thousands of times a second, may be even millions of times a second. We can calculate that up to high accuracy. But macro-miracles are very rare as I said. Why are they very rare? This is because the probability is very low. So turning the stick of Moses into a snake will not happen every day. It happens once in the lifetime of humanity, maybe even the lifetime of the universe.

Nevertheless I feel that this is an area where you have to take it by belief rather than digging into the scientific foundation of the miracles. In fact I can only emphasize here the conceptual possibility, not mathematical calculations.

SB – So you are telling me several things. First of all, physics leaves space for miracles…

MBA – Yes, conceptually.

SB – ...And in that case a miracle would be an extremely rare event, but not something beyond or against the laws of physics. If it would happen according to the laws of physics then it is still physical, not supernatural...

MBA – That's right.

SB – ...Secondly, you are also telling me that a miracle can be an event for which we do not have an explanation now, but it can be that we reach one in the future. So you are telling me two different, but related things.

Going back to the example of staves turning into snakes: First of all, it can happen again, some time, even if maybe not in our lifetime, and it would be just an extremely rare event, but a physical one, or it can be that some day we can explain how it happened. Moses could not explain it, but we might one day.

MBA – Miracles are miracles, but as I said sometimes you can provide some explanation to events, which might have seemed one day miraculous, but I

cannot guarantee that all true miracles are explainable within our known physics. In fact there are possibilities that we are still unaware of.

SB – So far we have been discussing the work of colleagues who share your competence in physics or in philosophy, and who in general agree with your point of view. Yet there are also critics who have a deep understanding of Muslim societies, and of Muslim philosophy and argue against this idea of harmony between Islam and science. For example, they hold that the so-called Golden Age of Islam was not actually comparable, in many substantial respects, to the modern world, so they try to attack the historical point of view. Do you recognize the existence of a Golden Age, and how do you define it?

MBA – Yes. I am aware of this criticism, I should say, because whenever I read such contributions I discover that the main point is misunderstanding, or misinterpretation, or quoting from unreliable sources. I can comment by saying that since the early Umayyad reign around 700 AD Muslims directed their attention into acquiring science. Khalid bin Yazid,[8] the son of the second Umayyad Caliph, refused to take power after his father because he wanted to concentrate on his work translating science books and working in chemistry. In the Abbasid times the Caliph Al-Ma'mun[9] was well known for encouraging scientific and philosophical debates. He even contributed at times to such debates.

There was a Golden Age that can be defined as such for various reasons. One reason is the liberty that was available in searching for the truth, and publicly discussing matters of natural sciences. For example, these *mutakallimun* were saying things that, if we now speak about them in public they might be considered as *khafir*, heretics, while at that time the *mutakallimun* were having their meetings in the palace of the Caliph. Well, you may say that this liberty was given, protected by the force of the Caliph himself. Correct. True, he gave them the protection to talk freely, to discuss, and to argue, to have meetings. But that culminated in, or produced, the scientific trend in the society on a larger scale and since then science flourished.

SB - One might counter-object that this kind of attitude was confined to intellectual circles and that it was not affecting society at large…

MBA – No, it was. It is not only that they were intellectual achievements. Intellectual achievements sometimes happen in dark ages of any society. The most important point, when you talk about liberty is the social interaction, whether there is social interaction or not, and whether there is social acceptance or not. Social interaction caused social unrest in the Islamic society. There were quarrels in the streets. Not between the government and

[8] Khalid bin Yazid (d. 704 CE), brother of the Umayyad Caliph Muawiyah II, alchemist and book collector. For a critical discussion of this narrative see Saliba 2007, 44–50.

[9] Al-Ma'mun: Abbasid Caliph, who reigned from 813 until 833.

the institutes, no, there were quarrels in the streets between the Mutazilites and the *fuqaha*, the traditional Muslims.

SB – So when you discuss the Golden Age you are not stressing the technological advancement but rather the freedom.

MBA – That's one aspect of what I might consent to call a Golden Age. Why should it be a Golden Age? First because of liberty; second because of the degree of diffusion to the society; and third, in my opinion, because of the originality of the contributions. These are the main pillars, which allow me to call it a Golden Age. You can be sure perhaps of the social effect once you learn how three sons of a thief have become three prominent scientists. These were the sons of Musa bin Shakir.[10] Their father started his life as a thief, and then he became an astrologer and brought up his sons in scientific educational circles. One of them became a mathematician, the other a mechanic and the third became an astronomer. These three sons of that thief led an expedition in the ninth century and measured the circumference of the Earth. Amazing! Obviously there are many other examples. But doesn't that reflect a social change?

SB – So you consider this as historical proof that Islam is in harmony with science.

MBA – Indeed. Also, if you go back to the accusations levelled against them by their contemporaries, they were sometimes traditional *fuqaha*, accusing freethinkers of being heretics. But the accusers soon shut up when they were reminded of Muhammad's *hadith*, according to which wisdom is the goal of the Muslim. He should take it wherever he finds it. There is no limit to truth; there is no ban on thinking. As long as you say *la ilaha illa Allah, Muhammad rasul Allah*, that there is one God and Muhammad is His messenger, it is finished. Nobody can ban you. But only when you say that your research proves that there are five Gods, for example, are you then eligible for punishment and a ban. As to the limit of thinking, yes, you are right in saying that it is not comparable to present-day thinking. Yes, it is not, because there were limits at that time, despite liberty. There was a limit, and that limit is not to defy God or the very basic beliefs of Islam. Otherwise you will be called a *zinidiq*, a heretic. Some people were punished for being a heretic, yes, because they were unbelievers. One more, very prominent example, is Al-Razi,[11] the doctor and philosopher who did not believe in God. He had a completely different idea about God, and he declared that, and his philosophy book was published at that time, but nobody accused Al-Razi of being non-Muslim. Why? Because he said 'I believe in God' in public, despite writing against this belief with his free pen and thought.

SB – How was he considered then?

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[10] Professor Altaie here refers to the Abbasid astronomers and engineers known as the Banu Musa, Muhammad, Ahmad and Hassan (9th century CE).

[11] Abu Bakr Muhammad ibn Zakariya Razi (Rey, Persia, 865–925), Persian polymath.

MBA – He was considered a *munafiq*, a hypocrite. They said that he wanted to get away with it. They say the Caliph hit him with his book on the head. Why? Because when the Caliph asked him if he is a believer or not he said 'I am a believer'. If you say *la ilaha illa Allah* I must accept it, I cannot prove that you are not a believer, unless I open your heart, as Muhammad said. Muhammad says: 'Have you opened his heart, how did you know he is *munafiq*?' So at the official level nobody can accuse anybody else of being *munafiq* unless he proves it to the very details, showing what he believes in his heart. Don't take Al-Qaeda's accusations of other people being a *munafiq*... They accuse everybody. This is not official Islam.

SB – Another frequent line of attack against the idea of a harmony between Islam and science is that its advocates pursue it out of a sort of inferiority complex, they just want to show that Islam is not backwards, that it is perfectly in tune with science, the most powerful and effective achievement of human thought today.

MBA – To some extent and in some cases this critique is correct. As I said earlier when you read writing like those of El-Naggar you can quickly recognize the apologetic trend dominating his discourse. But certainly such discourse is not necessarily representing the wealth of Islam. If we are to seek the truth in this respect we should scan the history of thought during the last centuries and compare equal times at different places. Giordano Bruno was burned alive in 1600 for accusations of being heretic; Galileo Galilei was harassed and sent in to custody in 1630 for his scientific claim that the Earth rotates. Many others, before Bruno and even after Galilei, had a miserable fate because of their scientific thoughts. In Islam we have no such examples. At times we had severe conflicts between different factions of philosophical groups like the one that happened between Mutazilites and the Asharites but this was only when politics played the role in mediating thought. No Muslim, Jew or Christian, to the best of my knowledge, was prosecuted for his scientific endeavour. In Granada and Cairo, for example, Rabbi Maimonides[12] was preaching his philosophy, which agreed with that of Averroes, unharmed. Yes, at times there were prosecutions of those who were spreading atheistic thoughts denying the basic pillars of Islam, like the incident of crucifying Ghaylan of Damascus[13] during the Umayyad reign and the execution of Mansur Al-Hallaj.[14] But even that was done somehow for political reasons.

Now coming back to the scientific content of the Qur'an we should realize that the Qur'an is a holy scripture. It is claimed to be the word of God, and here we have to look at it from two points of view. The first view denies any

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[12] Maimonides (Mosheh ben Maimon, Cordoba, 1135/1138 – Cairo, 1204), Jewish philosopher and physician.

[13] Ghaylan of Damascus: executed in Damascus in 743 CE; his doctrines on free will were regarded as heretical.

[14] Mansur Al-Hallaj (Fars, Persia, 858 – Baghdad, 922), Persian mystic. His controversial statements and teachings on the union with God led to an accusation of heresy and he was executed at the orders of the Abbasid Caliph Al-Muqtadir.

divine connection with its content and just considers it as authored text. Accordingly, we may find some turbulent obscure terms, which we might explain by assuming the ignorance of the author. The other point of view is to believe in the divinity of the Qur'an and in this case we have to work harder on its content.

SB – I see. But then don't you have to admit that at the time in which this revelation came at least some fractions of it were not understandable?

MBA – True. This is what I meant by saying that if we believe in the divinity of the Qur'an we should work harder. For we see that besides the unclear texts we have clear ones that point to facts of nature, describing certain phenomenon so accurately that it makes one wonder and admire the accuracy of such descriptions. Such descriptions imply knowledge that was unknown at the time of Muhammad. For example: the description given for the fate of the Sun is so elegant that one cannot deny the facts presented. We read in sura *al-takweer* that one day the Sun will collapse (81:01), the view of the stars will fade away or become distorted (81:02). At this point when you analyse the word 'takweer' chosen to describe the fate of the Sun and compare it to the best of our contemporary knowledge from modern astrophysics, you find that it is quite in conformity with what science is predicting. Mind you, at the time of revelation it was only known that the Sun is an eternal object and nobody is known to have suggested the collapse of the Sun. More than that the Qur'an describes the view of the sky during the time when the Sun comes to its fate saying that it will look as if the sky has been torn to appear like a red hide (55:37). This is the stage when the Sun will become a red giant according to modern astrophysics. At this stage an observer from the Earth will certainly see the stars are distorted. Then the Qur'an talks about the union between the Sun and the Moon and although this is something that astrophysics is not yet sure of – it is a possibility since we know that the Sun as a red giant will expand swallowing Mercury, Venus and will be very near to the Earth. Consequently there is the possibility that the Sun will swallow the Moon and the Earth too. Obviously there are many more details on this topic in the Qur'an, which I find to be quite in conformity with modern astrophysics. So, how can we deny the scientific value of such a description? For other examples from the science of embryology I may refer you to the book of Keith Moore[15] professor of embryology. So, again how can we ignore all this?

SB – So, it was obscure and it remained so until we were able to explore the space.

MBA – This is true and this obscurity can be explained once we accept that the Qur'an was set by divine source. How? Being a divine knowledge, the

[15] Keith L. Moore (b. 1925), Canadian anatomist who in 1986, after having worked in the Embryology Committee of the King Abdulaziz University (Saudi Arabia) published a paper arguing that the Qur'an contains precise embryological notions that cannot be explained in the light of human knowledge at the time of the revelation (Moore 1986).

revelations have to be truthful and most accurate. To put it in any language 1,400 years ago you have no alternative but to set it out in terms that might be obscure for some time, no doubt. This is why we say that the Qur'an reveals its content by time. In fact this is a statement you can find in the Qur'an too (7:53). Moreover, there are historical narrations telling that the *sahaba*, the followers of Muhammad, asked Him about some verses of the Qur'an, and He would say: 'Don't ask about things that you don't need'.

SB – And would you say that this also affects our understanding of the Qur'an today?

MBA – Naturally, as you see, the meanings of some verses of the Qur'an might well remain obscure until Doomsday. But at the same time this is good too since it stands as a challenge for the faculty, provoking further productive research on all venues including the scientific venue.

SB – Several authors, albeit in different ways, have spoken of an 'Islamic science'. One line of criticism levelled at this idea is that science itself is actually neutral. Therefore, it doesn't make any sense to speak of an Islamic science and it is a fact that scientists coming from very different traditions, for example a Muslim scientist and an atheist scientist from the West, came up with the same results. Do you agree with this?

MBA – It is correct. I would say that surely science is neutral in methodology and in inquiry. But beliefs affect scientific directions. Physics is not Islamic, not Christian, not Jewish. We can only call it Islamic dedication of science, or usage, or direction, or utilization.

SB – Another point that is used to discredit the debate about the harmony of Islam and science is that it incorporates a lot of pseudo-science.

MBA – Pseudo-science, yes, this is the problem. I consider it the biggest problem.

SB – There are authors who say that they can measure the speed of the Prophet's journey to Al-Quds, or of those people advocating the usage of *jinns* in order to obtain energy...

MBA – ...Right, not only that, but also the speed of light in the Qur'an, which actually puts them in a problematic position with the conceptual meaning of God, or the place where God exists. They claim that certain verses in the Qur'an provide you with the speed of light, and accordingly, the speed of the divine action in nature. Then, if this is true, and if the divine action, or divine order is travelling at the speed of light, then God, according to the verse, is situated somewhere 1,000 light years away from us. Only 1,000 light years away, which is within our galaxy. So it's reachable! Pseudo-science is a risk. And unfortunately all these people who are advocating this approach are not specialized. They are not specialized in the field. Give me one person who is specialized!

You know, pseudo-science goes even further. Perhaps you don't know about this stupid interpretation of the retrograde motion. One day I received

an e-mail saying that the Sun is rising in the west on Mars, and since there is a *hadith* of Prophet Muhammad saying that on Doomsday the Sun will rise in the west on Earth, therefore, if this is happening on Mars now, it could happen on Earth. When I looked at the original source, which fortunately was mentioned in that forwarded e-mail (forwarded to millions of people), I found that it was talking about the retrograde motion, nothing to do with the rotation of Mars around its axis. It says that the eastward motion has been reversed to the westward motion, so a stupid guy thought that this means that the rotation of Mars is reversed. It is not the case. It is the apparent motion of Mars in the sky, and this has been known since the Babylonian times, that there is the retrograde motion. So what I did was to explain what is happening, I translated properly that text and I tried to distribute it as much as I could to those people but unfortunately I discovered that one *mullah*, in Lebanon, was preaching this old story of the reversed motion of Mars. Nobody paid attention to my plea [Professor Altaie laughs]. Unfortunately, although, if you write my name in Arabic on the Internet you will find that a few websites are quoting me on this subject, not many.

SB – So you feel you are involved in a battle against pseudo-science.

MBA – It is a big battle, actually, not a small one, a big battle indeed, especially in this respect. It completely destroys your endeavour. It gives the wrong impression about what you are doing. Perhaps I will be accused of being a part of the same trend, trying to, as we say, change or distort scientific facts in order to present them to support one's argument.

Another incident was when I received pictures of a huge human skeleton. Men were standing by that skeleton and they were just the size of the ear.

SB – What was it supposed to demonstrate?

MBA – That ancient human beings, Adam, the first human being, was 60 metres long, as said in one of the *hadith* of Prophet Mohammed.

SB – And that picture was supposed to represent Adam's skeleton?

MBA – Yes, something like that. I sent an e-mail to the same person who was an engineer, asking, politely, that I am interested in research, I am a professor of physics, but I want to do research on human evolution, and if he would provide me with the source for this picture. They claimed that these pictures are taken from a site in Saudi Arabia, southern Saudi Arabia, where an oil company was digging and found the skeleton. And he wrote to me with shame that these pictures are unfortunately distorted with Photoshop.

SB - But then, how can you interpret the *hadith* about the height of Adam?

MBA – Unless science proves the contrary then it could be a true *hadith*. But if science would prove with certainty that this is not possible then it could be a false *hadith*, so one has to investigate.

SB – What is your opinion regarding the popular narrative of the splitting of the Moon?

MBA – I have asked Dr El-Naggar about this and he told me that he has no direct reference about the claim that there was an announcement by NASA that the rills on the surface of the moon are caused by the Moon splitting into two halves sometime in the past. El-Naggar replied saying that he has no authentic reference about this but he has heard the story from a friend who watched a BBC programme in which one astronaut was telling such a story. So as you see, the story is not authentic. Scientifically, rills on the surface of the Moon exist and they are as old as the Moon itself, not formed 1,400 years ago. Therefore, it has nothing to do with the splitting of the Moon.

SB – But then, back to the Qur'an, how do you interpret the verse regarding the splitting of the Moon? I mean, this is not like the *hadith*, where we can say it is a false *hadith* and discard it...

MBA – I believe that what is said in the Qur'an is something that will happen in the future. We should note that the verse can be interpreted as pointing to an event that will happen in future. Such an event may happen when the Sun will become a red giant as I described earlier. So supposing this will happen, definitely the Moon, by the tidal forces of the Sun will be split into pieces. Not only in two halves. It will be cracked by the tidal forces of the Sun. The Qur'an says, 'The Hour (of Judgment) is nigh, and the Moon is cleft asunder' (Q 54:1). It doesn't say it has happened. This is very important. Where does it say that it has happened? In a story some *sahaba* said that, and this story needs to be studied authentically and analytically. Only then we can judge whether such a view did happen at the time of the Prophet or not.

SB – It can be some kind of individual miracle, an illusion induced only in a group of people...

MBA – That's right. It can be something that has been seen by a limited number of people, who reported the incident. If we have to believe that this report was correct.

SB – But still, you are stressing that this is not the Qur'an but a narrative, which is outside the Qur'an.

MBA – The verse of the Qur'an, as I understand it, is not defining a time setup, it is only referring to the approaching Doomsday. It should not be taken necessarily as something that has happened.

SB – And how do you interpret Doomsday? Of course this narrative can be seen as having first and foremost a moral significance, but perhaps you have an interpretation of it that entails physics as well?

MBA – You see, once we leave this physical world, then apparently, according to scriptures, we should move to some non-physical world. My difficulty in being any good at discussing this point is that I have no tool to deal with the unphysical world. There could be. I am a believer. There could be an unphysical world in which events happen in no time.

You may ask me how events would happen in no time. Your dreams, for instance, are events in no space and in no time. You see a dream in which you

are tortured for example and sometimes you wake up and feel the pain in your body. Or the contrary if you experience a happy dream, you feel the pleasant emotions and then you wake up happy, you still have the taste of the dream. Where did that event happen? I mean the torture or the happiness. Certainly it is in an unphysical world, because it is some kind of a picture, it is like in a movie. It is a feeling, and that feeling has been initiated within the brain by some chemicals or electric charges. However, the ordered events that occur in some dreams are a challenge for the analysis. Why should events be ordered so as to symbolize certain meanings? The explanation given by Freud can only cover certain kinds of dreams, not all dreams. On the other hand, we cannot say that dreams are drawn from previous memories since it is not always the case. Rather it is a rare case where we have dreams repeating a past memory. It is then some kind of a connection to a non-physical world at work I believe. One day, science may discover this; I would expect that. One day, science may discover this new world, what I call a space-like world. In a space-like world, where the time is zero, you don't fear death.

SB – Now I would like to touch upon another of the thoughts that I have found in your work – the question of the meaning of life. If I understand you correctly you link the answers to the questions about the universe to the answers to the questions about the meaning of life. So, if the universe has a purpose, then also human life, our individual existence, has a purpose. Is it so?

MBA – Exactly.

SB – Don't you admit that also from the point of view of an atheist, (which you might be in a position to better understand than others) there can be a purpose in life or an ethic, a moral code, according to which you can live?

MBA – As far as I can see if you refuse to admit the existence of a purpose for the universe and consequently, as Steven Weinberg, the famous physicist, says, you cannot see anything else in this universe except 'feed and breed'. This could be the presentation of the atheist view, which I cannot understand. How come that such a construction, which we see in the solar system, in the galaxies, and in the clusters of galaxies has no purpose?

We cannot find any scientific evidence for life after death, as Stephen Hawking[16] declared a few days ago in an interview with a British newspaper, saying that life has no purpose and adding that he is not afraid of death. That's good. But then how come they see all this organization in the universe and do not admit the existence of a purpose at least? I feel that most atheists are atheists because they cannot accept the notion of a personal God that punishes and rewards, as is also expressed by Steven Weinberg in a dialogue with John Polkinghorne.[17] Weinberg says that he would accept the existence of God if a flaming sword would appear suddenly in the auditorium and chop

[16] Stephen Hawking (b. 1942), British physicist and author.

[17] Steven Weinberg (b. 1933), U.S. physicist, Nobel laureate in physics in 1979 (with Abdus Salam and Sheldon Glashow).

his head off. Again, you can see why Weinberg doesn't believe in God. Because he thinks that a universe run by a God should be a miraculous universe, whereas, it should be the contrary. Why should there be miracles? A miraculous universe, in my opinion, needs no God. It is arbitrary. Everything – construction, events, needs no arrangement and no management.

SB – Yet, back to atheism, one can counter-object that an atheist can also find his or her own moral code. I don't need to believe in an afterlife and I don't need to believe in a universal purpose in order to live a righteous life... Atheist is not equal to evil.

MBA – Correct. It doesn't mean evil, but then you have to take one risk, and that is trial and error. You keep trying certain moral codes until you find the better version. You won't find the best version because there might be none, no best moral code. But I feel that religion provides you with a guideline to the best possible moral code.

SB – Is this analogous to a gamble?

MBA – It is not a gamble at all, no, it is rather an endeavour that we have to make in order to understand ourselves – nature and consequently our destiny. If you are a sincere believer then you don't have to be an opportunist. Rather, you would not look for reward but would like to live the joy of knowledge in its widest sense. I have experience with atheism, as I told you, and I can tell you that atheism leaves you nowhere as you see no purpose for life except feed and breed. You do not enjoy life to its full meaning and you end up depressed and disappointed. The moment I became an atheist I became more prone to commit suicide.

SB – Another objection could be that there is a purpose in the universe, there is an order, but that purpose might well be indifferent to individual destiny. One can follow you very well in the details of your theories, one can see where they bring us, but still have a problem in linking the concept of God which you are developing with a God who really cares about us, a personal God, the God who cares about our individual, specific, very tiny vicissitudes. There is still a sort of hiatus, a gap.

MBA – I see your point, indeed. If we are going to try to realize the care in terms of the personal, individual level, then I can actually not see that. The individual has been provided with abilities to seek that in this universe through his creation. But then it is left to him, to approach God or to forget about Him. So for example, when Stephen Hawking or the atheists in general say 'ashes to ashes', there is no after-life; that is true. Once these people die they won't have a future, the future, in my understanding, in the after-life is what you would be seeking, looking for and expecting. You will get it if you believe in it. If you don't believe in it you will not have a life after that. Your life is 70 or 80 or 90 years. It is not a physical world that we are going to move to, although it has been told in religious scriptures that it contains a punishment or reward. Certainly it would but it is not physical.

SB – So you think that this pertains to your religious beliefs, the beliefs that you entertain on the basis of the scriptures, of revelation, but you don't have anything special to say as a physicist about that.

MBA – Exactly.

SB – So this is a field in which the Qur'an has priority.

MBA – Correct. It's a matter of belief.

SB – One can have a difficulty also in seeing a link between the God of the universe and the God of 'small miracles', like turning a stick into a snake. I mean, if compared with the whole creation, well – I don't want to sound blasphemous – but it is even a stupid thing... One can feel a difficulty in linking that God to the God who spoke to Moses, for example. One can say that it is like speaking of two different concepts, which can be rationally understood – up to a point – but it is difficult to make them overlap.

MBA – It is difficult to see that from the scientific point of view. But I remind physicists also with some facts. Till now we have not discovered everything in nature. For example, the magnetic monopoles. Nobody has discovered them at all. Although in theory, according to Dirac, Nobel Prize winner in 1930 when he was only 28 years old, a very bright scientist, perhaps even brighter than Einstein, it exists. Paul Dirac proved mathematically that the existence of magnetic monopoles is necessary for the quantization of charge. Nobody has discovered the magnetic monopoles at all, despite research for many years, since the time of Maxwell in 1875. In fact Maxwell by one equation showed that they do not exist in our physical world, but then later Dirac proved that they should exist for the electric charge to be quantized. And now the physicists believe that they are hiding somewhere. Where? Nobody knows yet. So, science is open to new frontiers and this calls us to be modest despite the great achievements of science. In no way can we reach final, conclusive results in this area. Even about God.

SB – So the openness of science also gives hope as to questions posed by religion.

MBA – That's right. The thing is that you should pay attention to the landmarks. If landmarks say that you are walking on the traces, which show that there must have been somebody here, a human being, an animal, a machine, a robot... it's much better than following a way that would lead you nowhere. If you are walking in the desert, once you see a landmark, it is better to follow it than to ignore it. In my opinion an atheist is going nowhere. Following very faint landmarks is better than nothing.

SB – Would you say that the Creator in the Qur'an is more abstractly defined, if compared to the God of the Jewish and Christian scriptures? And in that case, how can we reconcile this with the fact that God is actually defined, in Islam, with many attributes?

MBA – What are usually called divine attributes, as mentioned in the Qur'an and I believe in any other religion, is only a description given to people in

order to understand or to realize God. The purpose is to realize God, whereas the true fact of these attributes... They are metaphors, they are not true as such: God is merciful; God is fair in the Qur'an, harsh on the unbelievers. The way God was described in the scriptures may sometimes express God in a distorted way, unless properly understood.

SB – Even in the Qur'an, which is God's word?

MBA – Even in the Qur'an, yes. But then, we read in the Qur'an the reason behind this misunderstanding, let us just read the verse: 'Allah is He, than Whom there is no other god; – the Sovereign, the Holy One, the Source of Peace (and Perfection), the Guardian of Faith, the Preserver of Safety, the Exalted in Might, the Irresistible, the Supreme: Glory to Allah! (High is He) above the partners they attribute to Him' (59:23). Here we clearly see that the Qur'an is giving these holy names of Allah, but at the end of the verse it is reminding the reader not to take these attributes as a representation of Him. We make mistakes when we take these attributes literally.

SB - ...In exegetical matters don't you think that advocating a metaphorical interpretation might create more problems than it solves? Because on the one hand you seem to reach a more liberal view, more tolerant, but at the same time interpretations multiply, there is a flourishing of theories.

MBA – Correct. But then you have to have some constraints on your interpretations. These constraints are brought up by the lingual expressions on the one hand, and on the other hand by the texts, by the context itself, which will tell you whether you are right or not.

I will give you one example; you will be surprised. In London now there is a small society of young, educated Muslims, males and females. They sit every Friday to interpret the Qur'an and they send me their recordings. Yesterday I was listening to a recording about chopping off the hands of thieves. The speaker was telling the audience that the verse in the Qur'an is not making it clear where to chop off the hand. After a lengthy, open-minded analysis, through the open interpretation strategy which he adopted, he concludes that the verse of the Qur'an 'Cut off the hands of a male or female thief as a punishment for their deed and a lesson for them from God. God is Majestic and All-wise' (5:38) doesn't mean cut off the thief's hand by chopping it off, but prevent them from stealing again. This is chopping off not in a material sense but it is a metaphor, according to this open interpretation.

I wrote him an e-mail, telling him that I agree that chopping off the hand of somebody who stole a small amount of money is really bad and ugly, and I suggested that we find another way of taking or manoeuvring this problem in Islam. It is a problem, I agree, especially in the modern world. In Iran they chopped off the hand of a 21-year-old person who was accused of stealing a few pounds. We can get around this, but not through distorting the language by claiming metaphoric meanings to clear and elaborated words. And we cannot deny that there is 1,400 years of practice of chopping off the hands of thieves. So should we say that those who understood the Qur'an before us, all of them, were wrong, including during the time of the Prophet? Instead I can

say that we should define what is theft in this age, because theft is not an absolute term. It is an act which has certain circumstances related to it. And since it is money or property, then it is related to the economic situation. Secondly, we remember that Umar Ibn al-Khattab,[18] the second Caliph after the Prophet Muhammad, prevented chopping off the hands of thieves during times of hardship. This is well documented. Therefore, we are allowed to stop chopping off the hands of thieves at times if the circumstances allow us to do so. It's not an absolute thing that we are forced to do.

SB – So open interpretation, metaphorical interpretation, but with two constraints: tradition and language.

MBA – Yes. Exactly.

SB – Back to science. We have already touched upon Darwin. Can we expand on this? For instance, would you describe yourself as an advocate of Intelligent Design?

MBA – No, I would not describe myself as a supporter of Intelligent Design. But at the same time I believe that evolution is a fact of life, including the biological evolution of creatures. And there is no contradiction with the Qur'an, because the Qur'an left the way open in this area. It is the later interpreters of the Qur'an who formulated this theory, which they have apparently borrowed from the Jewish tradition, about the creation of Adam and how he was created out of clay, formed in the image of God and then Eve was later created from one of his ribs.

So I believe that biological evolution is a fact of life, but it might not follow the Darwinian suggestion of random mutation and natural selection. It would be very hard, mentally, to rationalize the random mutation and natural selection for one good reason. If it is random mutation then my eye could appear suddenly in my back. Why should we have two eyes, two ears? It is very difficult to explain this. Perhaps we need as much as 1,000 times the age of the universe in order to construct creatures through random mutations. I remember that Professor Crick,[19] who is one of the two who discovered the structure of DNA, calculated the time needed to form one chromosome and found that it is 10^{160} years. This is by many orders of magnitude greater than the age of the universe. Why is it that the age of the Earth (about 4,500 million years) has been sufficient to do the job? The weakness in Dawkins' explanation is this: if it is random, then we will end up either in full light or full darkness. I would suggest that it would be full darkness, because random fluctuations cancel each other. But Dawkins, for no good reason, suggests that biological evolution preserves the good things and therefore it is always progressive. Why should it preserve the good achievements? Why shouldn't another mutation cancel them, since it is random? Suppose that a creature

[18] Umar ibn al-Khattab, second of the four 'right-guided' Caliphs, he reigned from 634 until 644.

[19] Francis H. C. Crick (1916–2004), English molecular biologist, co-discoverer of the structure of DNA molecule with J. D. Watson, Nobel laureate (with J. D. Watson and M. Wilkins) in Medicine in 1962.

develops certain qualities, certain abilities, evolves an organ, or part of an organ, very slowly (I agree, organ generation is a very slow process). If it produces them, why couldn't they be destroyed in the next generation? There should be some law at work for the preservation of the good and useful qualities.

In these matters one has to be careful. There is evolution and there is Darwin's theory of evolution, and there is God obviously. Do they say that you cannot believe in evolution and God or in Darwin's evolution and God? You cannot believe in Darwinian evolution and God at the same time. But you can believe in evolution.

SB – So are you sketching a sort of God-guided evolution? There have been changes, changes even mentioned in the Qur'an...

MBA – This is what Polkinghorne calls the 'divine providence'. God guided the evolution. It's God's Providence.

SB – So this is also your own way of keeping God and evolution together.

MBA – Correct.

SB – With your colleague Professor Golshani I have been discussing the philosophical implications of quantum physics. Does quantum physics pose a conceptual challenge to Islam?

MBA – Well, as far as I can see quantum physics has no problem with Islam. To the contrary, Islam can provide the best interpretation of quantum mechanics. There are now four famous interpretations. The first is the von Neumann,[20] or the so-called Copenhagen school interpretation, then there is the statistical interpretation of Einstein and Max Born,[21] there is the hidden variable interpretation, and the multiverse, multi-universe interpretation. I propose re-creation, which is mainly an Islamic idea. Properties of matter and energy are not fixed but they are getting renewed billions of times in a second. And the one who is renewing these properties is the same character that created them, so it's God. If you adopt this idea you can show that it can lead qualitatively to the principle of uncertainty.

SB – Why do you support this specific interpretation? How did it develop? You first found the scientific principles according to which it is consistent, tenable, and then you discovered that is compatible with Islam, or you started off by advocating it because you were influenced by Islamic views?

MBA – No. That is not the case. But during my study of *daqiq al-kalam* I came across the principle of re-creation and found that it is a fascinating notion that could be utilized in physics. Some time later and through studying the problem of quantum measurement, it sprung to my mind that

[20] John von Neumann (1903–1957), Hungarian-American mathematician.

[21] Max Born (1882–1970), German-British physicist and mathematician, Nobel laureate in physics in 1954.

this novel idea of re-creation can be used for giving a new interpretation of quantum measurements. The question of the interpretation of quantum mechanics is necessary to understand the physical basis of what we call the basic postulates of quantum mechanics. Moreover, I believe that once we establish quantum mechanics on the correct interpretation, many of what we now consider to be paradoxes like the famous Einstein-Podolsky-Rosen paradox will be resolved. The quantum coherence and quantum entanglement will be understood in better terms. If we can achieve this clear understanding then we will be on the steps of a new era in physics. Now for about 30 years theoretical physics, including particle physics, has been suffering from a state of stalemate. If you look closely at the roots of the problem you will find that it is at least partially caused by the wrong paradoxical interpretation of quantum mechanics and the structure of quantum field theory. Here my project of *kalam* has one challenge where the scientific utilization of its doctrines can either succeed or fail.

SB – So science comes first.

MBA – To me, science comes first. Exactly.

SB - ...You do not choose it because it fits Islam.

MBA – No, certainly not. The question of the suggestion that the universe might be expanding forever does conflict with the Qur'an, nevertheless I teach it to my students.

SB – But still, you advocate that because it is science.

MBA – That's science, unless I prove against it. I will stand by the scientific fact. But then you should not accuse me of being in contradiction because I believe in Islam. I don't feel puzzled. Science is developing, so although we discover now that apparently the universe is going to expand forever, it could be that in five years we discover that the universe will collapse. As I told you, about my students' work, when we introduce lambda, the cosmological constant, we find that the universe is going to collapse if lambda has a given value.

SB – We have stressed that your work is a work in progress, that you have an agenda, that you haven't covered all the points yet, so what are the next steps?

MBA – You see, actually next year, I will have published this book in Arabic, which contains the Islamic view of nature, the philosophy of nature. Now, the next step is to build on it some social philosophy, which can be the basis for a new jurisprudence. Targeting or heading for a renewal of the Islamic sharia. We need to reform it. So in the end I want to propose a basis for the reformation of Islam.

SB – It is a very ambitious agenda.

MBA – It is. I believe I cannot do it on my own. But I believe that at least I can pave the way.

SB – How do you see the relationship between scientists and clergy, how do you think that it can be improved, if you see a conflict?

MBA – Well, I am an advocate of the dialogue between clergymen and scientists, certainly. I am very eager to see this dialogue. I have already tried to do one good thing. That is, to introduce astronomy to the *sharia* students. I devised a course in this university back in 2001. Since 2001, an introductory course on astronomy has been offered. My main targets are the students of Islamic studies. Unfortunately not so many people have attended it. Most of them are coming from the department of geography, not my target. Every year ten or 15 students attend it. I was hoping to have 50 students or more, in order to teach the clergy of the future about proper astronomy.

But you will be surprised. One day one of my students dropped the course. I was surprised, because he had good marks. His colleagues didn't know why. I met him on the street, and I asked him why. He said: 'To tell you frankly, I believe that this astronomy you are teaching will shake my beliefs. I will not be a good Muslim if I believe in your astronomy.' I said: 'What specifically?' He said: 'When you are talking about the Earth rotating around the Sun, whereas the Qur'an says that the Sun rotates around the Earth.' But this is again a kind of mental disability that you cannot take to represent the Islamic understanding in general. In our tradition, in Islamic tradition, there is a faction, the Salafites, who believe that astronomy, even modern astronomy, is speculative science. My evidence for this is the refusal of clergymen to cooperate with astronomers on the issue of a new crescent time announcement. Otherwise why should they accept the testimony of an ignorant person claiming that he has seen the crescent? This is a vital issue in the life of Muslims since it is directly connected with their religious rituals. In a recent paper that I have delivered to the 5th Islamic astronomical conference, held in Amman, I asked, 'Why could Muslims not discover the heliocentric model?' It is a big question. Muslim scientists, Muslim astronomers, were fiddling with the ptolemaic model for about five or six centuries, and they couldn't see that the solar system is heliocentric, not geocentric. I could recognize two reasons, first the belief in the doctrines of Aristotle on his view of nature. The second was the wrong interpretation of the Qur'an.

SB – So what do you conclude from this personal experience? Was it frustrating? Are you still optimistic?

MBA – Well, I am not very optimistic, because apparently their supervisors do not encourage them to study astronomy. This is an elective course and students usually choose courses on the advice of their supervisors and I found that unfortunately most of their teachers do not favour the study of astronomy.

SB – But maybe in the long run?

MBA – In the long run, yes. It's building up, but very slowly. But this is one step, a good one to do. A good thing is that there were many female students attending the course from the *sharia*. Sometimes you have 15 students from the *sharia* and ten are female students. So this is good. I was very happy with this course and I have written a book for them, in which I make their life easier since there are only few books about astronomy available in Arabic.

SB – So we can say that you are engaged on many fronts.

MBA – Yes, I am. I have devoted my whole time to this, and my presence here in Jordan has given me enough time, and it was also thanks to my wife, who takes care of the household, whereas I do it rarely. She does it by choice with full happiness as she feels that she is contributing to my endeavour. She has obtained her MSc in astronomy from Manchester University, UK, but she gave up teaching at the university a long time ago.

On this affectionate and personal note ended the long conversation about Islam and science with Professor Altaie. After a warm farewell, I took a taxi back to my hotel in Amman. It was becoming dark. I felt a sense of gratitude, for the time Professor Altaie had dedicated to our exchange, and for the biographical details he had disclosed to me. Likewise, I felt a sense of discovery, since our conversation had touched upon so many aspects of his ideas and activities that I had not inferred from his papers. I had been especially impressed by his didactic approach and ambition.

And in only one day another meeting was scheduled: that with Egyptian Professor of geology and TV celebrity Zaghloul El-Naggar...

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CHAPTER 4

There Can Be Many Deviations from This Main Straight Path

Conversation with Zaghloul R. M. El-Naggar

Zaghloul Raghib Mohammad El-Naggar (b. 1933, Meshal, town of Bassion, Gharbyia governorate, Egypt) is a professor of Earth Science and Geology. El-Naggar obtained his PhD in Geology from the University of Wales in the United Kingdom in 1963. After an academic career in the Gulf countries, El-Naggar now chairs the *Committee of Scientific Notions in the Qur'an, Supreme Council of Islamic Affairs* in Cairo, Egypt. His media appearances, his popular website and his numerous publications make El-Naggar one of the most successful advocates of the 'scientific interpretation' of the Qur'an, and one of the most controversial as well. According to El-Naggar, the presence of scientific notions in the Qur'an ahead of their discovery by humans is one of the demonstrations of its divine origin.

Before meeting him, I had tried to make myself familiar with El-Naggar's declared methodological principles, at least as they are stated in a French translation of his booklet *Scientific Truths in the Holy Qur'an.*[1] According to the 'programmatic section' of such a text, El-Naggar advocates a philologically accurate approach to the text, an approach aimed at grasping the exact content of its verses without distorting them or ignoring their context and historical origin, or forcing their meaning. El-Naggar also prescribes referring only to established 'scientific truths', and approaching the Qur'an with solid scientific expertise. In his opinion, the scientific interpretation cannot pertain Qur'anic verses that concern entities and events that cannot be experienced, such as the soul, the angels and *jinns*, or the hereafter and resurrection, which should all be believed by 'absolute faith' alone. In El-Naggar's opinion, a distinction should be drawn between the 'scientific miracles' *per se* and the 'scientific interpretation' as human enterprise. According to El-Naggar, any human enterprise is fallible by nature and therefore one should not ridicule the efforts of previous Qur'anic exegetes, and at the same time be aware of one's own fallibility. However, those who reach a correct interpretation will, as stated by El-Naggar, receive a double reward, whereas those who fail to do so will at least be rewarded for their good intentions; any mistake is always human-dependent and does not affect the greatness of the Qur'an. But the Qur'an, in El-Naggar's view, can also orient scientists in attaining new 'cosmic truths': when confronted with competing scientific hypotheses, a scientist should always opt for the one most compatible to

[1] El-Naggar 2008a.

the Qur'an. El-Naggar lists several virtues of the 'scientific interpretation' of the Qur'an, among which are its contemporariness as an effective means of propagation of the truth of Islam, its importance in emphasizing the relevance of Islam in order to avoid the catastrophes caused by the usage of science without religious guidance and, finally, its capacity to wake Muslims' interest in the domains of science and technology, in which, according to El-Naggar, they are currently lagging behind the countries of 'miscreancy' and 'atheism'.[2]

It has to be remarked that El-Naggar contributes to the diffusion, among others, of the narrative according to which the splitting of the Moon referred to in the Qur'an was a real event that took place twice during the time of the Prophet, and a phenomenon which was later confirmed by NASA explorations of the lunar surface. However, the professor does not claim that he has firsthand knowledge of the documents regarding such exploration. He reports that he was discussing the splitting of the Moon during a lecture at the Faculty of Medicine at Cardiff University, and advocating a literal interpretation of sura 54. Professor El-Naggar had just asserted that miracles are 'unusual incidents that break all the regular laws of nature' that Muslims are 'obliged' to believe in since they are narrated in the Qur'an and in the *hadith*, whereas 'conventional science' is not able to explain how they took place, when a man rose up from the audience and added some information. He was Dawud Musa Pidcock, then leader of the British Muslim Party, who narrated that in 1978 he had heard a TV debate between the British announcer James Burke and 'three of the American space scientists' who, while defending the usefulness of the expensive Moon landings, mentioned that only by direct exploration were they able to prove 'that the Moon had been split a long time ago and rejoined, and that there is a lot of concrete evidence on the surface of the Moon to prove this'. Upon hearing such a statement, Pidcock was convinced of the truth of the sura he had previously found unbelievable, and this led him to embrace Islam. El-Naggar reports as well that the splitting of the Moon is recorded in 'the Indian and Chinese calendars'.[3]

I met professor El-Naggar on 20 May 2011 in Jordan. It was a sunny and quiet afternoon and I was received at a private home in the outskirts of Amman. I must admit that I was slowly hypnotized by his oratory. His Egyptian inflection pleasantly reminded me of my colleagues and friends in Alexandria, where my intellectual adventure had started. Tea and pastries completed Professor El-Naggar's and his wife's hospitality. Only once would the professor interrupt the conversation, in order to serve his prayers in a room nearby.

Stefano Bigliardi – Let us begin from the beginning. Can you tell me what were the most influential traditions, intellectual trends and authors who contributed to shaping your theories? Did religion come first, or science?

Zaghloul El-Naggar – I was brought up in a very committed atmosphere. A Muslim family, a learned family, a family with many scholars, four generations, a big library, Islamic library, in the house, and I was also taught

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[2] See El-Naggar 2008a, 7–27.

[3] See El-Naggar 2010, 69–73.

in very good schools that had a feeling for Islam and the Islamic obligations were very well observed. Once I went to Cairo University in 1951 I was faced with lots of opposing ideas. There were communists, atheists and agnostics. I had to face these people intellectually and answer their questions. I was a student in the college of science and the themes of science and religion do not agree. There are contradictions and much opposition between scientific conclusions and many religious ideas in general, not necessarily Islam. When they spoke of the theory of organic evolution, I had to refute their argument. When they spoke about the eternity of the universe, and that the universe had no beginning, and will never have an end, of course I had to tell them that science disproves their claim. Luckily I had one of my professors in the department of geology who was a very eminent scholar and at the same time he was a good Muslim. He used to help me in that matter. In his lectures he used to give many examples of scientific precisions in the glorious Qur'an and in the Sunnah, and sayings of the Prophet of Allah (peace be upon Him). So this is when I started, in 1951.

When I graduated from Cairo University I went to England to complete my PhD in geology and of course this was very close to the 1956 war when Britain, France and the Israelis invaded Egypt. Their defeat created a very rough feeling in Britain towards Egyptians in general. But of course I was a student, I wanted to do my PhD, I had no intention of becoming involved in political issues but it had to happen over the years without any intention. People asked about the war, the reasons behind it, why did we take that stand, so I had to answer them. I had to say that the invasion was illegal, unethical, and of course this gradually developed into a sort of comparison between Islam and other religions. Since I can debate religious issues and answer questions about Islam I was invited to many congregations, conferences and meetings to talk about Islam and its relationship with other religions. In as much as the Muslims believe in the unity of the Creator they also believe in the unity of the revelation, as our Lord is one, His guidance to men is one. There can never be two correct religions; there is only one religion, with many deviations from this main, straight path. So inasmuch as the Creator is one, his guidance to men is one and this guidance was revealed to Adam and Eve on the moment of their creation. Whenever humanity lives according to the divine guidance they live peacefully and happily. They enjoy life and understand their mission on the surface of this planet. But the struggle between man and the devil is a symptom of our existence so sometimes Shaitan, the devil, wins and turns people away from their religion. Sometimes people win and stay with the religion. This process has continued since the very early days of human existence on Earth and will continue until the end of the world.

SB – And these were your ideas from the very beginning.

ZEN – This form of divine guidance has been revealed by a long chain of prophets and messengers and finally there had to be an end to this process of guidance and the end was the revelation that came down to Muhammad (peace be upon Him). And being the last form of divine guidance to men, God has taken the responsibility to preserve this guidance and that's why the

glorious Qur'an is the only form of divine guidance to men that has been kept intact in exactly the same language of the revelation, the Arabic language, preserved by the will of Allah, word for word, letter for letter. Although we believe in the divine nature of the Bible (*injeel*, as the Qur'an calls it) received by Jesus Christ (peace be upon Him), we believe in the divine guidance that came down to David, (the psalms of David), Moses (the Torah) and Abraham (the books of Abraham). We have to believe in that long chain of messengers without the slightest discrimination. Yet we believe that these sources of divine guidance have been lost and what is in the hands of both the Christians and the Jews is a distorted form of the original divine guidance. [4]

SB – And how was the reaction of the audience to these ideas, especially in England?

ZEN – Different. Sometimes people would accept this in a very broad mind and sometimes they would try to oppose it. But of course this was the theme. I have been trying to give the Qur'an to the people and ask them to read it. Even in translation, although I do believe that no other language can demonstrate the divinity, which we feel in the Arabic text. You cannot translate the Qur'an from Arabic to any language and maintain the divine nature of the Arabic text. Yet, one can feel intellectually whether this is the work of God or the work of men. Anyway, I went on doing this for quite a long time.

SB – Do you think that there was any original element in your preaching or were you just voicing pre-existing ideas...?

ZEN – You see, I wouldn't call it preaching but an intellectual dialogue. I am not a clergyman; I was trying to give what I have to as many people as I can in the kindest way possible.

SB – But do you think that this was your original contribution or were you just trying to be a means of transmission of some message that was passed on to you?

ZEN – I don't think that I invented this; this is Islam. But the way of presenting it was new. The arguments I was giving were new but I didn't give anything from my own mind. Anyway this whole process brought us [to the question] 'How can I demonstrate to the audience that the Qur'an is the word of God?' The Qur'an is a book of guidance for men in areas that cannot be correctly addressed by men. Such as the area of faith, the area of acts of worship, the area of the moral code and the area of the code of transactions with others. These four basic areas are the foundation of the divine guidance. And the need for the divine guidance in these areas is very obvious because no man can create the faith for himself. Faith is mainly established on the basis of believing in the unseen and unless you receive an authentic divine statement in that area you can never be correct. Acts of worship by definition

[4] Professor El-Naggar refers here to the doctrine of *tahrif* concerning the corruption of Jewish and Christian scriptures (argued on the basis of Qur'anic passages such as 2:79); see Lazarus-Yafeh 2013.

necessitate obedient submission to the divine guidance, and unless you receive a divine word in that area you can never be right. The moral code and the code of transactions with others, although I believe that Allah has created man to be a moral-loving being and that every human being has got in himself or herself an innate love for morality, yet he or she cannot tailor for themselves a moral code that is precise and correct. If the moral code was left to people to tailor, he or she can either make it too tight to be possible or too lax to be useless. So even the moral code has to be divinely tailored without the slightest human infiltration. The transactions between people can also be impossible for men to tailor in a fair and just way because man has got an innate degree of selfishness, fear of the future and love for possession. If you leave the code of transactions with others to tailor, he or she can spoil it completely. So these four basic foundations are the essence of religion. If we can compare these four basics foundations of religion in the Qur'an and in any other belief from the many '-isms' of the time, we can really see the difference between a divine guidance and a mixture between divine guidance and human work. Of course this has created a lot of arguments. One can argue for example that he or she is happy with the Christian faith or with the Jewish, the Hindu faith... But it is not a matter of personal happiness alone. Love of believing in the Creator is innate in the human nature and unless one can find the correct faith, the devil can infiltrate in people the feeling of a false satisfaction with any other faith. Scientific precision of the Qur'an is not debatable and hence, scientific notions in this noble book can be used to invite Islam in to the main language of our time, science.

SB – Were there other texts or philosophers or theologians who inspired you in some way, apart from the Qur'an of course? Have you ever changed your mind in your long career, or are these ideas, which you are communicating now through the new media, the same as in the very beginning?

ZEN – Of course I have read many books, I do believe in reading. Reading is a good, illuminating way into the human brain. I read texts that agree with my own ideas, as well as texts that disagree because you cannot see the truth without a good comparison between different ideas. I have read texts directed at communists, atheists and agnostics, as well as nationalists.

SB – Have you ever been influenced by philosophy?

ZEN – You see, we had a conference here in Amman two years ago. The conference had a large number of philosophers and one of them is a leading atheist. I had never met him before. I read his work so I knew how far away he was from the truth. We sat one day at lunch and two members of the cabinet were at the same table. He started arguing about scientific notions in the Qur'an but he was defeated in no time as he had no argument. There was a scholar from Syria sitting next to me and after we finished our meal he said: 'Actually, you have slaughtered the man!'

SB – But what about the great Islamic traditions in philosophy?

ZEN – Some of them were successful.

SB – But you wouldn't say that they influenced your work.

ZEN – No, no. I read Ibn Sina and Al-Ghazali, and have written a book on the contributions of early Muslims to the area of science and technology, which came out last year, and of course I analysed their work, but I was not deeply influenced by them.

SB – Can you quantify your work on the Qur'an and science? How many books and TV programmes?

ZEN – I have got about 80 books today and many of my books have also been translated into several languages. This book [*Scientific Facts in the Glorious Qur'an*] has been translated into eight languages. It contains only five verses and it is meant to open the minds of people to read the Qur'an. My own idea is that I would like every human being on the face of this planet to read the Qur'an with an open, critical mind, to see whether this makes sense or not. That's the whole idea.

SB – And how many TV programmes?

ZEN – Hundreds of programmes.

SB – When you look back at your huge production over the last years, do you notice any changes, are there any points where you have changed your mind, or would you describe it more as deepening some ideas?

ZEN – Deepening I think, as the basic structure remains there. I don't think it is going to change, I can develop more than what I have already, if I have time to review what I have written. Of course I can improve, definitely. Every day I am getting some better information, a broader vision of many of these issues, but human knowledge can never come to an end.

SB – When did you decide to use the new media – TV, Internet? Did you have any doubts about using such a channel to convey your ideas?

ZEN – No. You see, in Egypt we had a form of – a dictatorship, since 1952 until the fall of Mubarak in February 2011. This dictatorship of course did not want Islam to spread; it did not like people to know about Islam. They wanted people to live according to their nationalistic ideas: we are Egyptians, we are the descendants of the Pharaohs, we have built a great civilization in the past and we have to repeat that again.

SB – So using the new media was a way of bypassing this ideological barrier...

ZEN – No, I was actually forbidden from being in the media for quite a long time by this dictatorship. I was only allowed very recently to appear in the media and this did not come until I was invited by Al-Jazeera, and two or three other programmes which made me very well known in the Arab world.

At this point they started inviting me to Egypt but before that I was not allowed.

SB – Can you tell me who is your readership or your audience? What kind of people are you targeting? Well-educated? Everybody? Potential converts?

ZEN – No, I don't think everybody. Actually, science is a substantial subject; it is not an easy subject to grasp so I don't think that a layman would be seriously influenced. Maybe emotionally motivated but he would not really understand what I am talking about. My address is usually to the intellectuals but amazingly enough I was once walking down the street and a layman asked me what is a light year so I explained what a light year is...Normally my address is not to the laymen but to the intellectuals.

SB – When one reads your work some similarities with preceding traditions can be discerned, like the scientific interpretation of the Qur'an, *tafsir 'ilmiy*, and also with other authors, for example Maurice Bucaille, or the Turkish author Harun Yahya. What is your stance towards these other trends or authors? What do you consider original or different about your work when you compare yourself to them?

ZEN – Maurice Bucaille, I knew him personally. We have met in Bandung (Indonesia) many years ago at a conference. I enjoyed reading his three books very much, and to me he represents a Western intellectual who was faced with the Qur'an and read it with an open mind, with no prejudices and pre-set ideas. That's why he wrote these wonderful three books: *La Bible le Coran et la Science*, *What is the Origin of Man* and *Moses and the Pharaoh*. His writings were actually very interesting but his work did not influence me. I started writing about this in 1951, long before Bucaille, but of course I enjoyed reading his work very much.

Harun Yahya sent me several of his works to edit. I was in contact with him a number of years earlier. I was influenced by neither Maurice Bucaille or Harun Yahya and his group (he is not a single man, it is a group of workers), but both of them did a great job. No doubt about that. But their shortcoming is the lack of the proper knowledge of the Arabic language, which was actually a little bit of a hindrance in their own work, but both of them contributed very well.

SB – So you would say that Maurice Bucaille's books are still current, not out-dated?

ZEN – No, I think he did a good service. No doubt about that. But we have to keep in mind that science is advancing at a very high speed, and there is a lot of new information that can be added to what Bucaille mentioned. But actually he did a very good job.

SB – And what about preceding trends? Because Bucaille himself was not completely original, there had also been other authors...

ZEN – Yes. There is a big school in Egypt and in other countries that did a great job. There is Shaikh Tantawi Jawhari[5], who in the 1950s wrote along these lines. There is Mohammad Ahmad Al-Ghamrawi.[6]

SB – Did this tradition influence you?

ZEN – Yes, definitely. Ghamrawi was the Dean of the Faculty of Pharmacy in Egypt, and in Saudi Arabia we were together in Riyadh for a number of years, but of course we discussed a lot of ideas together and his books have influenced me quite a lot. Ghamrawi taught at Al-Azhar University a course called 'Meditating in the Divine Laws of the Universe', a wonderful book. This was in the 1930s – mid-1930s, more or less. There are a large number of [such authors]. Mohammed Mahmud Ibrahim was the Chairman of the Petroleum Engineering and Mining Department in Cairo University, and wrote a book on geology and the scientific precision of the Qur'an. So I mention most of these names in my books.

SB – In more recent years some intellectuals came up with the so-called Islamization of science. What is your stance towards this trend?

ZEN – Actually, I initiated this trend, on the necessity of rewriting science from an Islamic perspective. I published this in 1975. Actually, al-Faruqi and his group in America were seriously influenced by this paper that I gave in a conference in Riyadh in 1975. This conference was to be held in 1974 but due to the assassination of King Faisal (may Allah bless his soul) the conference was postponed. So I presented that paper on the necessity of rewriting science from an Islamic perspective, because I had noticed something very important. Although science has developed in the West, at a fantastic speed, most of the scholars in the West are holding a purely atheistic conviction. Very few of them can express freely their belief. I have lived in the West for quite a long time and I have noticed how deep the fear is to show that you are religious. To maintain your status in a scientific medium you have to show that you are atheist, agnostic, away from religion. The men may not be atheists, but they have to show they are. This led me to write that work. For example, every book I studied in geology or in astronomy used to have the slogan at the beginning: 'There is no vestige for a beginning nor sign for an end.' Claiming the eternity of the universe, which has been scientifically disproved.

SB – ...Are you referring to books in Egypt?

ZEN – This is in Egypt, but it is so worldwide, actually. Atheism has been the trend of the current civilization and actually science, which just started from an atheistic point of view, from at least a neutral point of view, is starting today to confirm the necessity of believing in a creator, to confirm the fact

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[5] Tantawi Jawari (1862–1960), Egyptian secondary school teacher mostly known for his 26-volume *Al-Jawahir fi Tafsir al-Quran* (Jewels in the Interpretation of the Quran), published between 1923 and 1935 (see Jansen 1974, 44–46).

[6] See Al-Ghamrawi 1975.

that this universe is not eternal, to confirm that creation is above the capacity of man, to confirm that there must be an end to our existence, to confirm that resurrection, accountability and judgement must be true.

SB – So you conceived of the so-called Islamization of science not as something that is superimposed on science but something like going back to what science properly is.

ZEN – Indeed. I don't mean, by 'Islamization of science', that you will throw the scientific knowledge away. This is not true. It is the wealth of humanity. We have to cherish and preserve it. What I am saying is that we have to rewrite these good scientific contributions in a language that does not defy religion. In a language that does not cancel the belief in the Creator. In a language that does not defy the necessity of resurrection, accountability and judgement because this is the essence of our existence on the face of this planet, and if you defy it, ignore it, contradict it, then you are lost.

al-Faruqi was definitely a great personality (may Allah bless his soul). I felt that in losing him we have lost a great scholar. No doubt about that. But al-Faruqi was not scientifically minded. He was on the side of the arts, and he was looking at the issue from the humanistic point of view – the same thing with Seyyed Hossein Nasr. These two figures actually did a great service to the idea, each one from his own specialization. Nasr wrote about the Islamization of education – that was great because you cannot really reconstruct the human thought without correcting the system of education. I admired both of them but actually the area of Islamization needs to start first with science, experimental science, because it is precise, it is exact. One plus one equals two. You can rectify any misconception quite easily and then after doing this we have to go to humanities because the area of humanities is more elastic, is broader, you cannot correct in this area as easily as you can in the area of science, and I give many examples for that.

SB – What about other contemporary scientists who are developing the discourse about Islam and science? Altaie, for example, or Golshani or Guessoum?

ZEN – I know all of them personally. But Altaie did not write much, actually... I don't think he has contributed much to that area. But Golshani, I have his book, he comes from a scientific background, but again he has the shortcoming of not perfecting the Arabic language. Guessoum – I don't think he wrote much. I saw him in one or two interviews, and in a conference that was held in Bahrain a year ago or so. But I don't think he has published much.

SB – But do you think there is any hope for a believer who is not a native speaker of Arabic, any hope of attaining this truth? I mean, is this an insurmountable obstacle or it is a shortcoming related to these scholars – they might have improved Arabic?

ZEN – I am talking about what they have published. You see, of course if you want to handle a Qur'anic verse the first thing is that you should understand

the verse word by word. You have to understand the exact meaning of every word in the verse; you have to understand the environment during which the verse came about, the *asbab-u-nuzul*, as we call it. You have to understand if the Prophet (peace be upon Him) has commented on that verse in that way or the other, you have to collect all the literature containing that verse, to see what other commentators said about it...

SB – Do you think that this shortcoming resulted in a weaker work or in mistakes on the part, for instance, of Bucaille?

ZEN – No, as I said Bucaille did a great service, no doubt about that. And he opened the door very wide; he encouraged many people to write along these lines. So did Harun Yahya, no doubt about that. But I cannot compare the work of Harun Yahya and Bucaille with Golshani or Altaie.

SB – You are very often quoted as the Head of the Commission for Scientific Miracles in the Qur'an...

ZEN – Yes. I don't like the word 'miracle'. 'Scientific Precision in the Qur'an' is better.

SB – This name to someone might sound somewhat strange. Can you tell us more about its history, its activities, and its procedures...? And also, you have been very critical towards Egypt, but isn't this an institution which is embedded in the Egyptian government?

ZEN – Yes, you see, when you look into the Qur'an, you find that the verses that deal with the foundations of the religion are very obvious, very clear. They can be easily understood by the laymen on the street as much as by a professor at Al-Azhar University. The verses that really need elaboration are the scientific notions, and the scientific notions in the Qur'an and Sunnah are written in a way that every generation can see something in the verse, and these understandings integrate, generation after generation, without contradiction, and to me this is one of the most beautiful aspects of the Qur'an. So a layman in the desert, fourteen centuries ago, would listen to the verse and understand something out of it that is correct. Today we can understand a broader meaning. In between you can find many interpretations, and these interpretations all integrate without contradiction. So, that is what we did in this committee...

SB – ...Which still exists?

ZEN – Which still exists, yes. It contains a large number of scholars in many different fields. We have the area of geology, astronomy, physics, medicine (different fields of medicine), biochemistry, biology, history, Arabic language, commentary on the Qur'an, scholars on *hadith*, scholars in *fiqh*, scholars in history, especially ancient history. When we are reviewing the commentary on the Qur'an, verse by verse, we have been doing this for almost eight years now and we are coming towards the end of this process now.

SB – And it belongs to the Egyptian government?

ZEN – Yes. It's part of the Ministry of *Awqaf*[7] but it is a separate body that contains many chapters. We have one on civilization, one on the commentary of the Qur'an, one on *hadith*, one *fiqh*, one on history... Actually there are three projects. We have a short-term project that is coming out very soon; we have almost completed it. So, when we come to a verse that needs to be explained to us by a medical scholar, the medical scholars would tell us what they think about it and we discuss it as a group together. When it comes to a history issue, we need a historian to be with us...

SB – So the purpose of the committee is to produce a commentary on the Qur'an or to supervise or to examine the proposals of people who want, for example, to publish a book, and they submit it to you?

ZEN – We do both jobs. So actually we are now moving towards producing a commentary on the Qur'an with the scientific comments, not just linguistic. We have a footnote to the scientific comment on the Qur'an. This is called *al-muntakhab*. Then we have another lengthier project, called *al-wasiit*, meaning 'intermediate', and we have *al-mufassal*, 'the elaborated version', and this is the work of the committee. Then when this is sent to the press after reviewing it carefully we start *al-wasiit*, 'the intermediate', and when we finish that we will be able to do to the detailed form. We receive suggestions from the experts, articles that we publish, books, which we publish, conferences that we hold, or will hold, we are open to all suggestions.

SB – You have mentioned your clash with the dictatorship, or your political difficulties. Was it difficult, then, to receive such a role in an institution that, after all, is part of the state?

ZEN – Yes, but you see the dictatorship would actually stop us from being in the media but they considered that a work of this nature illuminated their own image to the people, producing a book on the Qur'an, or a book on *sira*.[8] They would consider it as polishing their own image.

SB – Is the committee an Egyptian institution, or is there any international collaboration?

ZEN – No, no, this is an Egyptian institution, but of course we cooperate with other organizations in Saudi Arabia, UAE, anywhere in the world.

SB – We have mentioned the very core, the pillar of the interpretation of the Qur'an, which is to refer to the text in its original version. What are the other principles?

ZEN – Of course if a verse has got any scientific connotation, we have to ask the scholars in that area to tell us what they think. If the verse speaks about the creation of heavens and Earth we need scholars in the area of astronomy to tell us if the verse holds any meaning for them, if it agrees with any major

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[7] Endowments.

[8] Biography of the Prophet.

conclusions that have been reached in the area of astronomy or if it contradicts findings. We hold these types of discussions in the area of medicine, in the area of biology, and so on.

SB – Are you aware of some criticisms from scientists, who are also believers but criticize this kind of investigation? They follow, in their criticisms, mainly two lines. Some say for example that sometimes you exceed your field as a geologist, you go beyond your competence, you start speaking for example of Darwinism – this would be bad scientific practice. According to another line of criticism this approach can encourage pseudo-science.

ZEN – You see, the sad thing about our current education is that it has adopted the idea of overspecialization. When you overspecialize you are bound to delve deeply, you can contribute immensely in a very narrow area, but sadly it isolates man from his human nature. Overspecialization has changed the science of our time into small wheels in a big machine. Everyone is doing his work and doesn't know where this work is going to lead. All of man's efforts, time and energy are channelled into a narrow area, but man is not meant to be a machine. Man is an honoured creation of our Lord, man is the most esteemed of God's creations and man has a mission on Earth and unless he fulfils that mission he fails his examination, he fails this life. Man should specialize, but should not bury himself in a narrow area of specialization and isolate himself completely from the rest of his obligations.

SB – So, if I interpret you correctly this criticism stems from overspecialization.

ZEN – Not only this. I find that criticism of what I am doing and of what people like me are doing stems from the fact that science is being taught in a purely secular way. So a scientist would not dream of having any relationship with religion unless he has been trained in that direction. Ninety-nine per cent of the scientists in our era believe that they have to devote their time to the narrowest area of specialization and should never expand from it. He doesn't think of the possibility of moving out of the specialization, he doesn't dream of it. I have met many scientists in Egypt who are good scientists and good Muslims at the same time but they have been educated in a system that is purely secular and they do not believe in the interaction of religion with science or science with religion. Likewise, we have scholars in Al-Azhar University who are good scholars in Islam but they look upon science as theories that are bound to change year after year and the scientific discoveries can never become a fact. Scientific knowledge is partial knowledge – it cannot face the Qur'an or the Sunnah of the Prophet (peace be upon Him). So this is a group of people who can criticize what I am doing. Another group are atheists or agnostics or communists, we have all those types of people, and they were always saying that the contradiction between science and religion is the main support for their isolation from religion. Of course when they find that science is supporting and defending religion, of course they try to oppose that and we have many examples of that. So people who oppose this trend or tradition are either opposing the fact that they don't believe in that

interaction or are afraid that this merging between religion and science would completely destroy their ideologies of communism or atheism or agnosticism.

SB – What about those essays or conferences where the speed of the Prophet in his night journey to Al-Quds was calculated? Critics deem all this to be pseudo-science, very bad scientific work and also bad for religion. Or think of those people advocating the usage of *jinns* in order to produce energy and so on...[9]

ZEN – Well, you see, in any human society you are bound to find deviations, in any human community. I have met people in the West who believe in many funny ideas – this is not only in our community. And you can never ever group people into one area of conviction. People are different and they will remain different. What I would like to say is that human knowledge is partial knowledge and I put human knowledge into a pyramidal form. The base of the pyramid is pure and applied sciences. If you don't know the laws of nature, the laws of creation, you cannot be a constructive element on the surface of this planet. It is not enough to describe a good flower in detail, or describe a good fruit in detail, or describe the precision of the running of the universe in detail and then forget about the rest. Unless this leads you to the wonders of creation, to the greatness of the Creator, you have done a great injustice to yourself and to the audience that is listening to you and that is why I place philosophy of science at a higher level than pure and applied sciences. You have to see the wisdom behind everything you study and everything you look at otherwise you have just buried yourself into the lowest level of human knowledge. Above that should come humanities, because man is the most honoured creation of the Creator. All knowledge that is related to man should come above knowledge of matter and energy. For instance languages with their own literatures, fine arts, history, economics, sociology, business administration are related to man and thus they should be ranked higher. At the peak of the pyramid you find the revealed knowledge, because as I said earlier the revealed knowledge is a divine guidance to man in areas that cannot be correctly addressed by man, such as the area of faith, the area of acts of worship, the area of the moral code, and the area of the code of transactions with others. No man can study this pyramid of knowledge in full. You have to specialize in a thin layer of any of these levels. But to be an intellectual you have to get a glimpse of every one of these five levels. If you isolate yourself you become a small wheel in a big machine. And man is more honoured than to be a tiny part of a big machine.

[9] In his *Islam's Quantum Question* (2011) Nidhal Guessoum (see conversation in this collection) is particularly critical of a conference on 'Qur'anic Healing' held in Abu Dhabi in 2007, which saw Professor El-Naggar's participation as keynote speaker. The conference, reports Guessoum, included presentations of pseudo-scientific notions such as 'Qur'anic energy', purportedly liable to be intercepted, channelled and transmitted by a special device (Guessoum 2011, 5–6). Similar ideas and 'inventions' are largely reported and ridiculed by Hoodbhoy 1991.

SB – So you recognize that there can be somebody who says he is taking up the matter of Islam and science but he is doing a bad job if he loses this overview.

ZEN – Definitely, one must have this integral outlook. Of course, I am a geologist by profession but I have improved my knowledge of the Arabic language, I have improved my knowledge of Islam, I was offered a PhD in the Qur'an and *hadith* from a Malaysian university last year, because of my contributions. If I had buried myself into a tiny little area of geology and I would live and die in it without knowing who am I, who has created me and sent me to this world, what is my message in it, how I can fulfil that message to the best of my abilities and what is waiting for me after this life. I would indeed have done a great injustice to myself.

SB – Do you think that Islam entertains a privileged relationship with science?

ZEN – Definitely. If you read the Qur'an you can see clearly in several Qur'anic verses the instructions to look, to meditate, to think, to understand, to interpret. The Qur'an laments people who go blind into this world without looking into the wonders of creation. The Qur'an holds knowledgeable people in very high esteem, and that is why the Islamic civilization was the leading civilization on the surface of this planet. For ten centuries or more Muslims were gaining knowledge in every sphere, not only astronomy and medicine, but in every field.

SB – What is your stance towards the internal differences of Islam? Sunnite, Shiite, do you address a readership belonging to only one of them, do you speak to all Muslims...?

ZEN – I think I am for all Muslims. I don't take a line, but you see, differences in the Muslim world are natural. You have differences in Christianity that are much wider and broader and even more bitter than the differences between Sunni and Shia. I do believe that the Shia movement is basically a political movement, it is not a religious movement; it's a difference in opinion about the leadership, who would lead the country. After drawing a straight line in the sand, Prophet Mohammad read the verse where Allah says 'This is my path, as straight as it could be. Follow it, because if you deviate from it you will be lost' (6: 153). 'If you deviate, you'll be bound to be lost.' And he drew lines at angles with the straight line and he said 'At the end of each of these lines is a devil that is inviting people to his own ideas, to his own thoughts, to his own ways of thinking, trying to deviate men from the straight path of Allah'. In any community, not only among the Muslims, you can never find people who are following the true belief 100 per cent. You find people who understand 90 per cent, 70 per cent, 50 per cent, zero per cent. And this is in any community. And this is mainly the essence of deviation.

SB - ...But you do not take a line, you say. When you write, you write for a Muslim audience.

ZEN – I write for a Muslim audience.

SB – What is your stance towards other religions, monotheistic religions at least? Do you try to set up a dialogue?

ZEN – I do not attack any believer. I think that a part of the integrity of the human nature is that man is a freewill being, and man is an honoured creation of God. With this understanding I do believe – and this is also an Islamic belief – that part of the dignity of man is that any man should be left free, 100 per cent, to believe in whatever he likes, without any obligation. So long he is not using this to defame others or to disrupt the human community and create havoc in the society. On the basis of this there will be eternity in the life to come either in paradise forever or in hell forever. So I don't criticize Christianity and I don't criticize Judaism. I criticize the Jews who have occupied Palestine by force, because they have no right to be there. I criticize their cruelty, their anti-human behaviour against the Palestinians. I criticize that. I am a human being. But of course I do not criticize Judaism as a belief. They are free; let them believe whatever they like.

SB – You said that Islam is in a privileged relationship to science. Do you think that other religions are less privileged and that maybe we can place them in order in a hierarchy?

ZEN – History can be the judge of this. Science is presented in the West by an atheistic, or materialistic attitude that is negative towards religion in general. I do not think that any other belief throughout the history of humanity has encouraged scientific endeavour as Islam did. We can see this during the Islamic civilization. Actually, most of the up-to-date technologies in the West have their own roots in the Islamic civilization. Muslims have actually civilized Europe through Spain, through Italy, through islands in the Mediterranean. Islam brought civilization to the Western world. Islam has established a great civilization when the West was in the dark. The Dark Ages was the Golden Age in the Muslim world. So you can judge by this.

SB – But still, some people point out that, in contemporary times, many great scientific discoveries were made by people with a wide spectrum of beliefs. Some of them were believers, some of them were Muslims, some of them were even atheists. How do you respond to this objection?

ZEN – You see, our Creator is the absolute justice. Life has got its own rules. If you adhere to these rules you are bound to succeed. If you move away from these rules you will never succeed even if you are the most pious person. Piety encourages you to endeavour, to explore, to work hard, and to try to discover the laws of Allah in this universe. If you don't do that, others will do it. And I agree with you that most of the recent scientific discoveries have been made by people who are mainly unbelievers. And that is why I have been calling for the Islamization of knowledge.

SB – Let's take up the topic of miracles. We use the word 'miracles' in English, but actually if you look closer into the Arabic language you find different terms. You find *ayah*, – a term that can be used in many senses,

not least to define the verses of the Qur'an. In Sufism we find *karamaat*. A miracle, when one speaks of a 'scientific miracle' is the Qur'anic prediction of a specific fact or phenomenon. Moreover we find in the Qur'an reference to events that we would define as supernatural, like Moses' staff turning into a snake. What is your concept of a miracle?

ZEN – You see, 'miracle' as an Arabic word means a supernatural event carried out by the Creator to support the prophethood of a prophet or of a messenger. Miracles cannot be explained scientifically. I cannot explain how Moses' staff changed into a snake. I cannot explain that – it is something beyond human nature. So the word 'miracle', or *mujiza* in Arabic language means a supernatural phenomenon that can only be carried out by God as a testimony to the prophethood of a selected man. I don't use 'miracle' for science at all, because this is something above science.

SB – So you think that the expression 'scientific miracle' is misleading?

ZEN – I don't use it. It's misleading. It is definitely misleading. I use 'scientific precision', 'scientific facts': I use 'harmony between the Qur'an and science', 'scientific signs of the Creator in the Qur'an'. But I don't use the word 'miracle' at all because even in the Arabic language we don't use it for ordinary human beings. If you have a pious man you use *karaama*. We don't use 'miracle' because a miracle is something above human nature. When I speak about scientific precision of the Qur'an I use *ayat*, signs, scientific signs in the Qur'an, scientific precision in the Qur'an.

SB – But do you recognize the existence of supernatural events both in the Qur'an and in extra-Qur'anic narratives? For example in Sufism, there are many miracles...

ZEN – In Sufism there are *karamaat*, not miracles.

SB – What about the supernatural events ascribed to Jesus in the New Testament?

ZEN – I don't reject them because first of all Jesus is a messenger from God and his miracles are mentioned in the Qur'an.

SB – Do you believe in miracles in Sufism – supernatural events in Sufism, extra- Qur'anic miracles?

ZEN – No, no. An ordinary human being can never ever have a miracle. Miracles can only be donated to messengers or prophets to testify to their prophethood.

SB – So you don't believe for example in the healing qualities of a Sufi saint?

ZEN – It is not a miracle. This is not supernatural. A medical doctor can heal. So I don't want you to confuse between the two words.

SB – Yes, but there are followers of Sufism who can make a pilgrimage to the grave of a saint and they claim for example that by touching it they would be healed, and something similar happens also within Christianity.

ZEN – This is completely un-Islamic. Because in Islam we believe that once a person dies he is dead, he has no power to do anything. You may study his history, you may study his ethics, his morality and his ideas and benefit from it but he has no power. He is dead. He cannot do anything to you, and that is why Prophet Muhammad (peace be upon Him), is told to have said 'If you seek anything, seek it from your Lord'. So really in Islam we believe that everything in this universe is controlled by the Creator. The Creator alone can give and take. The Creator alone can help and support, defeat and destroy. So why should you seek it from a human being like yourself?

SB – But wouldn't you accept that healing, that supernatural healing is given by the Lord, by Allah, through the dead person?

ZEN – This can only be given to a prophet or a messenger, not to any ordinary man.

SB – Do I sum up correctly your thought if I say that you don't think that miracles, meant as supernatural events happen today?

ZEN – Yes, they do not happen at all. They happened in the past, because every prophet and every messenger of God to men had to have something supernatural to testify to his correct prophethood. In Islam we believe that every messenger is a prophet and not every prophet is a messenger. If the message is there, and the people have turned their backs to it, then Allah sends a prophet to bring people back to the message. If the message has been lost or distorted Allah will send a messenger with a new message from exactly the same source to guide people in exactly the same way that was done before. This is why we say every messenger is a prophet but not every prophet is a messenger. In the past miracles did happen only to prophets and messengers, to give moral support to this man chosen by God to give His guidance to people. To testify to the people that he is a true prophet or a true messenger. But when we have any good sign from an ordinary man we call it *karaama*. And *karaama* means something good; it is not supernatural.

SB – We discussed earlier that while science and history advance further some meanings of the Qur'an are illuminated. We can understand it better. Do you think that in some cases we can gain scientific knowledge, which allows us to understand a miracle in scientific terms? I give you an example: it can be that the parting of the Red Sea appeared as a miracle at the time of Moses, but now we can explain it through a theory... There might have been some geological phenomenon. You are an expert on this... So would you accept that in the history of Qur'anic interpretation we sometimes arrive at a point where we can say that something appeared supernatural but now we can understand that it was a sign but still natural?

ZEN – But you see, what happened to Moses is something different from the opening of the Red Sea. The opening of the Red Sea can be understood

geologically very well. But what happened to Moses is that the water of the Red Sea parted, the water stood up as a wall and the mud dried out completely for Moses and his followers to escape. No science can do this. This is something beyond the capacities of scientific knowledge. So Moses did not open the Red Sea. Actually Allah has given him this miracle.

SB – So when you see a supernatural event in the Qur'an you don't feel embarrassed as a scientist.

ZEN – No, no, because this is the work of the Creator, Who is capable of ordering things to happen and they will come true.

SB – You don't advocate for example a metaphorical interpretation.

ZEN – No. I have to take it literally and I understand Allah has the power of doing everything and Allah has created this vast, immense and orderly universe that can really astonish every good brain. Allah is able to do anything.

SB – Also suspending His own laws.

ZEN – I don't mean that I don't need to explain it. I cannot explain it. All the physical miracles that are mentioned in the Qur'an – and some of them are mentioned in the Old and New Testament – are beyond the capacity of men to explain. We cannot say a word about them. We take them literally as mentioned in the Qur'an; we don't even try to explain them.

SB – We also said that as history and interpretation advance we can better understand the Qur'an. Do you accept the idea according to which there are obscure parts in the Qur'an, parts that we cannot understand at all?

ZEN – No. There is nothing obscure in the Qur'an. What I said earlier to you is that the Qur'an is basically a book of guidance to men in areas that cannot be addressed correctly by men, such as the area of faith, the area of acts of worship, the area of the moral code and the area of the code of transactions with others. These four basic areas are explained in the Qur'an in a very simple language. A layman in the street who has no education, if he listens to a verse from these four areas he can understand it clearly. If the Qur'an says 'You should know that there is no God but Allah' (47:19), everyone can understand that, that there is no deity except Allah. If the Qur'an says 'Establish your prayers' (17:78), that needs no explanation. 'Fasting the month of Ramadan has been an established obligation upon you as it was an established obligation upon the people before you' (2:183) does not need any explanation.

SB – There are no obscure parts?

ZEN – Nothing. The things that need elaboration are the scientific notions and the historical notions, and some areas of *fiqh*, the judgement, the Islamic jurisprudence. These are the areas that need scholars to explain to the laymen.

SB – Another interesting point which I have found in your book here [*Vérités scientifiques dans le Noble Coran*] is that sometimes the scientist, in deciding between competing theories, is helped by the Qur'an.

ZEN – Definitely. For example the Big Bang. It's one of the theories that are put forth to explain the origin of the universe and I support this theory because not only is it the more widely accepted one, to astronomers, but it has support in the Qur'an, that's why I accept it more than any other theory. In many other areas you can see that you can use the Qur'an to choose between alternatives because areas of creation annihilation and resurrection within these three dimensions – the creation of the universe, the creation of life, the creation of man, the annihilation of the three and the resurrection of the three – these areas can never be reached from scientific endeavour as facts. The most I can put forth is a theory and these theories are bound to change, they are partial in their own nature. I put out a theory and that is why I can never ever reach an established fact in any of these three areas. The Qur'an can help me to distinguish between many human ideas.

SB – Then you are not afraid of scientific change, because you acknowledge that scientific ideas and theories can change, but the Qur'an provides a guide in deciding...

ZEN – Indeed. What I am saying is that experimental science usually proceeds in three successive stages: a hypothesis, a theory, a scientific fact or a law or a correct mathematical equation. If science reaches this level of being a fact or a correct mathematical equation, it does not go back. It can be elaborated upon, or it can be expounded, but it does not reverse, it does not go back. So I always use scientific facts in descriptive verses of the Qur'an, I don't use a theory; I don't use a hypothesis.

SB – So you are telling me that there is a part of science that will not change. Theories change, facts don't.

ZEN – Definitely.

SB – This is an idea you can find in Bucaille.

ZEN – Yes. It doesn't mean that it cannot be expounded. It can be expounded. It can increase, it can develop but it will not go back, it will not reverse.

SB – You speak of course from the point of view of a scientist and a believer. What do you think of religion without science?

ZEN – Well, good enough. I cannot ask from a layman anything more than believing in the Creator, believing in the resurrection after death, in accountability, in judgement, in the eternal life to come and to be a good human being, a good element on the surface of this planet.

SB – And what about science without religion?

ZEN – Science without religion can be very destructive. I do believe that if you develop scientifically without having a good religious background, without having fear of your Creator, without having fear of accountability on the day of judgement, it can increase the evil on the surface of this planet. And actually this is the main element of our humanity today. In the West for example you have developed scientifically at a wonderful level, but at the same time if you ask anyone of them 'Where are you going after this life?', he doesn't know. 'Who created you? Who sent you in this life?' He doesn't know.

During the Gulf War I was teaching in the University of Dhahran, in Saudi Arabia when the Americans and the Europeans came in 1990. I had to talk to them because they lived in the airport and this was next door to the university, separated from the university only by a barbed wire fence. Major generals didn't know 'What is after death?'. They were scared of death. With all the armour they had, with the large number of soldiers they had, they were scared to death about where they were going if they died. So really if you develop man materially and you don't develop him emotionally and religiously and morally, actually you are developing a demon that can destroy this world with the mighty material power he has. He has no inhibitions. What would stop him from killing, from burning a whole city? That is what happened in Hiroshima and Nagasaki in 1945. I was in Japan a year ago, and I was shocked. Since 1945 till 2010 people are still dying from these two bombs, these small bombs of Hiroshima and Nagasaki. The soil is polluted, the water is polluted, the air is polluted, the animals' milk polluted, the babies are born deformed, and this is a great crime.

SB – And this is the result of science without religion.

ZEN – Definitely yes.

SB – You have travelled around the world and you have been teaching in many countries, in Muslim countries. What do you think of the state of scientific education today in Muslim countries?

ZEN – I think that we in the Muslim world are suffering from division. In the past we used to be one country, from Mauritania to China. Due to the division, our natural resources have been dissipated. Our human resources have been dissipated. That's why we have been left behind in the area of science and technology because scientific research is very costly, very expensive. I recall that two years ago there was an experiment run by some European countries to simulate the big bang, which cost three billion dollars. They had to dig a tunnel under the Alps just for one experiment and they actually did not prove anything at all. So really science has become a very costly exercise and with the division of the Muslim world into little entities we have dissipated our natural resources, our human resources. As a result of the dictatorships that have ruled the Muslim world with the aid of the West, we have been left behind more and more, but *inshallah* with the new liberations in Tunisia and in Egypt and the revolutions that are coming in the region, we hope that in a very short time we can initiate a good scientific

revival. We had the tradition in the past and I do believe that in 25 years we can build a big scientific body in the Muslim world. We have many scholars in many different countries of the world, we have many very good brains but really, we are living in a world of big human agglomerations, countries like the U.S., the UK, China, India, Russia... Small entities cannot exist, so we have to get together once more and try to pool our resources.

SB – Are you referring to an academic unification or a political one?

ZEN – It has to come gradually of course. And it has to start with science. These days, we have no cooperation between the different universities. We can run into short lines parallel to each other. We don't accumulate our efforts so we need to do that.

SB – So you think that there is hope, especially in the light of the recent upheavals in the Arab world.[10]

ZEN – I have big hopes, really, that we are heading towards a better future in every sphere because man cannot live his humanity completely without freedom, and a Muslim cannot live Islam fully without freedom. We have been oppressed for quite a long time between the Western colonization and our dictatorships, we have been passing through many hardships and I think that the end for these hardships is coming closer, *inshallah*, and once we can establish a free democracy in each of these countries we can restore the region in no time, *inshallah*. We have very many good resources: human resources, natural resources, big land areas, many seas that are within our control. I think we can re-establish ourselves in no time, *inshallah*.

SB – You have mentioned the danger of overspecialization, hyper-specialization, and the risks deriving from science without religion. Of course one cannot change the mind of a generation of scientists overnight. That would entail, if I interpret you correctly, that sometimes the clergy, or religiously enlightened people, should guide the work of the scientists. But what do you think of the cases in which they are not competent enough – or what happens when they have opposing views?

ZEN – But you see, I always call for correcting the educational system. If you want to rectify a society, begin with the educational system. You don't expect to change the people within a few years. Of course we have to rely on rectifying our curricula, especially in Islamic education.

SB – Also for the clergymen?

ZEN – We don't have clergy in Islam. It is not like Christianity or Judaism. We have scholars, and unless these scholars are better educated they cannot be scholars, they cannot really help in that change of the society. So I have been always calling on correcting the educational system, particularly in a university like Al-Azhar University because these are the leaders of the future

[10] I was here referring to the events that marked the so-called 'Arab Spring', starting in December 2010.

and if we educate them properly then *inshallah* things will go well. Not only in Al-Azhar but I stress the need to correct the educational system everywhere, from primary school to university.

SB – So, if they attain the due degree of competence you think that also divergences will disappear.

ZEN – Yes *inshallah*.

SB – Do you remember the debate over organ transplantation in the 1980s, in Egypt?[11] In that case, two different religious authorities held opposite views.

ZEN – Yes, but this is not really an Islamic issue. This is purely a medical issue. I have met medical doctors. I have participated in debates on this topic many times. In one of these debates the doctors were opposing it. They said for example that if you take a kidney from a poor man who would like to sell this kidney in order to live, but if a problem occurs with his other kidney then you have killed him. This is a practical issue, rather than a religious issue. This is an applied issue: if medical doctors and scholars of Islam would get together and understand how they can do it properly without any harm, one could do it.

SB – Two other hot spots of the discourse about Islam and science today are Darwinian evolution and quantum physics. Can you sum up your stance towards them?

ZEN – You see, I don't think that Darwinism is correct. I always say that, if you mean by 'organic evolution' that this planet was gradually inhabited by successive forms of life, that is correct, and we have to believe in it, because Prophet Mohammed (peace be upon Him) is quoted to have said 'Wisdom is a thing that a true believer should seek, wherever he finds it, he should cherish and preserve it'. So if I take a section in any succession of rocks I can see clearly that the fossils in every bed or group of beds differ from what is above it and what is below it.

So, if you mean by 'evolution' that our Earth was gradually inhabited by successive forms of life, this is absolutely correct. And we know the wisdom of it today because these fossils are actually guidelines, punctuation marks. I can discover oil, gas, minerals, ground water, knowing the age of the bed – quite clearly, through a correct observation. But this was mistaken by atheists who made three claims that have been proven incorrect. The first claim is that if

[11] The debate on organ transplantation in Egypt in the 1980s was mainly shaped by two opposing figures, both endowed with religious authority and prestige, who held different views. Shaikh Muhammad Mutawali Al-Sharawi (1911–1998), Minister of Endowments until 1978, who enjoyed immense popularity thanks to his Friday afternoon TV programme on Islam, spoke against organ transplantation on the basis of the idea that organs, not being owned by human beings, cannot be donated. In contrast, Shaikh Muhammad Sayyid Tantawi (1928–2010), Grand Mufti of Egypt from 1986 to 1996 and eventually Grand Imam of Al-Ahzar until his death, condoned the practice (under strict conditions), defined as altruistic while at the same time describing the question as medical rather than religious. See Hamdy 2008.

life evolved in that manner, there is no need for creation. Why should one look for creation? They say that solar energy reacted with the mud of the soil and the first protein molecule was created and this started to divide, producing the first living cell and this started to develop until it became a man. This is absolute nonsense because the living cell in the human body is so complex that it exceeds any big factory man has built so far. The living cell in the human body is in the order of 0.03 mm in diameter, and the complexity of that living cell, its efficiency defies any random creation.

A current scholar from Switzerland, Agustin Eugène-Guye,[12] published an article a few years ago which said that the building blocks of a protein molecule are the amino acids, and the amino acid is built of five elements: carbon, hydrogen, oxygen, nitrogen and sulphur, and they may or may not contain phosphorus. He said that he tried to calculate the chances of collecting these five elements out of 105 elements known to man, and he found that this is virtually impossible. You will need a mass as big as this universe, multiplied by an astronomical figure of the age of the universe – fourteen million years – also multiplied by an astronomical figure, for the creation of a single amino acid by chance.

Moreover, these five elements are arranged around the carbon atom in a three-dimensional form that can be either right-handed or left-handed, dextro or laevo. In all living beings, plants animals and humans, the amino acids are arranged in the laevo direction, the left-hand direction. Once the living being dies, these atoms rearrange themselves into the right-hand direction, by a very precise rate. So much so that if you find any remnants of a living being, you can calculate the rate of the right-hand amino acids to the left-hand amino acids, and you can determine the moment of death of that being very precisely. And this phenomenon is called the racemization of the amino acids. It's amazing. They say that the animal has died, the plant has died. What control can change the right-hand direction of the amino acids to the left-hand direction at a very precise rate? Who could do that? It cannot be explained.

Thirdly, the amino acid is water-soluble. If it was created by chance, who would isolate it from its environment?

Fourthly, for the amino acids to build a protein molecule they have to be arranged also in the left-handed direction and they have to be bonded by a chemical bond called the peptide bond. Who would control this other than the Creator himself? So the assumption that life has started by chance has completely collapsed.

Some scholars believe in what they call 'evolutionary creation', that this first cell was created and then started to evolve. But evolution tends towards complexity of life forms and this cannot happen without guidance.

I recall in the 1960s a book was published in England titled *The Naked Ape*, by Desmond Morris.[13] This book was answered by a professor of geology

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[12] The reference is perhaps to be intended to Charles-Eugène Guye (1866–1942), Swiss physicist (see Guye 1925). Charles-Eugène had a brother called Philippe-Auguste (1862–1922), also a chemist.

[13] English ethologist (b. 1928). See Morris 1967.

from Helsinki University, named Björn Kurtén,[14] and the book is titled *Not from the Apes*. From a purely scientific point of view the complexity of the human skeleton cannot possibly be produced from the highest animal before man, the orang-utan. Comparing the human skeleton alone – without even taking into consideration intelligence, emotions, capability to learn, and to educate others, and to gain skills –the differences between man and ape are so big that the whole age of the universe is not enough to produce men from orang-utans by evolution. He ends the book by saying 'Here man came into being out of nowhere, was he sent from the Heavens to Earth? Is it a return to the story of Adam and Eve, or it is a question which needs ESP men – extra sensory perceptive men – to answer?' Of course people speak about *The Naked Ape* and they don't speak about *Not from the Apes*. So really the current man has a tendency to disbelieve, a tendency to stay in an atheistic attitude, an ignoble attitude and that is why I stand fully against atheism, organic evolution although I work with many palaeontologists and I work with fossils.

SB – Not even in an evolution guided and supervised by God?

ZEN – That is what they call creative evolution or evolutionary creation, but I don't think that this is true, because there has never been a link found between one group of animals and another. All these links are artificial.

SB – So you admit that there have been species, which have disappeared, because they have been destroyed by God, but you do not admit that there has been an evolution from species to species.

ZEN – No, there is no evolution from one species to another.

SB – For example, the dinosaurs were destroyed.

ZEN – Destroyed, yes. I wrote about the extinction of the dinosaurs, I can see that clearly. Every form of life has got a role to play, and once this role comes to an end, it's the end.

SB – You have mentioned Desmond Morris. Are you also familiar with the works of the contemporary advocates of atheism supported by Darwinism, such as Dawkins?

ZEN – Definitely. I have a big library about evolution at home in Cairo, a very big library, and I have read a lot. And I am writing a book now about evolution, because last year I was invited to speak by Arabic BBC. They told me it would be a dialogue on evolution and when I went I actually found a conference with hundreds of people at the library in Alexandria. I was on the stage with a Christian scholar from the American University in Beirut and Professor Guessoum from the American University of Sharjah. I have to say it was not a good show as the whole purpose of the conference was to impose teaching organic evolution on all the educational systems in the Arab World.

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[14] Björn Olof Lennartson Kurtén (1924–1988), Finnish-Swedish palaeontologist. See Kurtén 1971.

SB – But some Islamic scholars hold that the Qur'an mentions some creation 'by stages' of the human being.[15]

ZEN – This describes the successive stages in the development of the human embryo, it has nothing to do with organic evolution.

SB – So you don't think there can be some kind of Islamic-compatible theory of evolution.

ZEN – No. No, I don't think so, because the Qur'an says clearly 'Allah is the Creator of everything' (13:16). So I have to accept that.

SB – Do you venture also into the field of quantum physics, discussing determinism, indeterminism...?

ZEN – Quantum physics is an area that actually needs somebody who is highly qualified in mathematics and physics and these two areas are far away from my concern. I have never really written anything about quantum physics.

SB – What about your work – what is your agenda for the next years?

ZEN – I have finished three big encyclopaedias. One on scientific notions in the glorious Qur'an, that came out into ten volumes; each volume is 500 to 600 pages.

SB – All this written by you? You don't have a team?

ZEN – Yes by myself. This encyclopaedia is in 12–13 volumes. Ten volumes have come out and about three volumes are still in press. In the other encyclopaedias I follow the cosmic verses in the Qur'an, with the Qur'anic arrangement, that can help people who do exegesis on the Qur'an to find the verses quite easily. I started with the first chapter of the Qur'an and I have ended with the last. This came out in five volumes and I am still working to complete it *inshallah*.

SB – So you conceive your future work more as the communication of ideas that you already have, than the development of ideas.

ZEN – No actually development can come out when we are doing this. Many ideas are actually coming out one by one. I have made a complete exegesis of the Qur'an in one volume and I am writing a second volume in very simple language, and both volumes have been translated into English and Malay. I was in Malaysia and Indonesia last summer and I found that they have translated my books into the Malay language. The third work is scientific notions in the Sunnah, traditions of the Prophet (peace be upon Him).

SB – Bucaille for instance did not describe his work as a personal achievement or discovery. He said that if he hadn't done that somebody else would have.[16]

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[15] 'Seeing that it is He that has created you in diverse stages?' (71: 14).

ZEN – Yes, every person has got a limited span of time and the main thing is that you should make good use of your time. Human work can never be perfect; you can always have pitfalls here and there. I think I have to finish what I have envisioned and let people coming after me continue with this line. The main thing is that I have encouraged a large number of people to work in that field. I am here [in Amman] because I am teaching in the International Islamic University, both at graduate and undergraduate levels, and I am examining a PhD thesis next week on scientific notions in one of the *tafasiir*. I have established this course in a large number of universities in the Arab world, in the UAE, in Lebanon, in Egypt, in Morocco, in Sudan. The more people deal with it, the more new ideas can be developed. I have also travelled to Canada and Europe and I have tried to help people enter this field of research.

SB – Do you think you are developing a new form of Islam?

ZEN – Not of Islam, because Islam is eternal – so not a new form of Islam. I am presenting a new service to the understanding of the cosmic verses in the Qur'an because as I said earlier these verses are expressed in a language that is absolutely miraculous, because a layman fourteen centuries ago read the verse and would understand something from it, and with the development of human knowledge we can see more in the same verse and these successive interpretations of the verse integrate without the slightest contradiction. And to me this is one of the greatest miracles of the Qur'an.

SB – Do you see any internal threats to Islam? Deviant versions of Islam?

ZEN – No, I think that Islam is a very simple religion that can be understood from its main sources: The Qur'an and the Sunnah. These two sources are currently preserved in their original language. Anybody who seeks the truth can easily find it, but whoever wants to deviate can do that.

SB – You have travelled in the West, in Europe and the U.S. I am sure you are familiar with the mis- or preconceptions about Islam, for example the association of Islam and terrorism.

ZEN – You see, the sad thing is that people in the West are subject to a lot of misinformation about Islam, many misconceptions about Islam. And of course to somebody in the West who claims to be advocating liberty and freedom of thought and preserving human rights and the dignity of man should never rush to conclusions without proper information. Islam is an Arabic word that stems from tow roots: *salam* which means peace and *tasleem* which means submission. So Islam is the peaceful submission to the will of the Creator. A religion with such a beautiful name can never have any relationship with terrorism. So people in the West have no knowledge about Islam. There are many human devils who are trying to defame Islam in most of the Western media and of course the laymen in the West neither have time

[16] I am here echoing Bucaille 1984, 163.

to read about Islam nor have they any sources of knowledge other than the TV or radio or the newspapers and magazines which are fully within the hands of anti-Islamic groups.

I do think that many of the Western troops are more terroristic, have done more injustice than any of these young lads that could be misused by the intelligence organizations to defame Islam and use their arrogance as an excuse to invade Muslim countries and destroy them. Actually, Al-Qaeda was mainly established by the American CIA. I was in Saudi Arabia when the Russians invaded Afghanistan. America wanted to defeat the Russians with other people's hands. They were instructing the Egyptians to industrialize armaments for these guerrilla fighters, and the oil companies would pay the bill. The Americans would take the armaments, go to Pakistan and give half of it to the Pakistani intelligence and the other half to these freedom fighters. They invaded those people's lands and played with their minds. Most of them were young lads with no real Islamic education. They were just antagonized by the Russian invasion of Afghanistan out of feelings of brotherhood for the Afghanis. They went to defend them. And actually they were easy prey for the American intelligence services, which used to provide them with the armaments and they shaped Al-Qaeda. When they clashed, of course there were these mad and crazy events that have nothing to do with Islam. In Islam you can never use violence outside of a battlefield. So long as you are dealing with civilians you can never raise a gun, you can never raise an armament against them. So you should never judge Islam by these young lads actually made up by the CIA.

SB – Do you think that a scientist might encounter difficulties if he or she declares faith in Islam – in Europe or in a non-Muslim country? This is what happened to Maurice Bucaille, according to some narratives aimed at explaining why he never clearly stated he was a Muslim.

ZEN – I have a great admiration for this man. He was brave enough to stand up for what he believed to be correct, and not many Westerners can do that. I have met many Europeans who have read about Islam and who admit that Islam is the true religion, but they never had the courage to stand up and speak their minds openly. Maurice Bucaille had that courage and I admire him for that. He didn't do it for money, he didn't do it for fame...

There is a theological college, in Birmingham, where I was invited one day to speak about the scientific notions in the Qur'an. They had a man from America – I forgot his name – who actually came to debate with me about these ideas, and while I was speaking about scientific notions in the Qur'an this man disappeared. They looked for him everywhere and couldn't find him. Then the following morning we had a meeting at a tea party and I asked him why he disappeared since he had come to debate with me. He answered that I tried to defame the Bible and he couldn't stand that and had to leave. Then I started talking about Maurice Bucaille and he said that he was bought by Saudi money, which is a big lie.

Maurice Bucaille did not embrace Islam in Saudi Arabia. He knew about Islam in Egypt, his visits to Saudi Arabia came much later. You find people who try to discredit this man unduly such as the American William

Campbell[17] who wrote a book against the scientific precision of the Qur'an and in which he attacked Maurice Bucaille. I had great respect for Maurice Bucaille because at least when he was certain he had the courage to stand up and to speak his mind.

SB – Even if it is difficult to find a passage in which Maurice Bucaille clearly admits, in first person, that he converted?

ZEN – You know, sadly enough, the Westerners, who claim to be democratic and advocating human freedom and human dignity, become the most fanatic people when it comes to the area of religion. I lived in the West for many years and I wouldn't say everyone but the majority of them are very fanatic. Most of the Christians in the West take religion as an idea rather than as a belief – which they can analyse critically. That is why Maurice Bucaille preferred to keep his belief between himself and his Creator.

Really, because in Islam we believe that every newborn baby is born into Islam, the natural religion that Allah has destined for all his creations. And then his parents would change it to Christianity, to Judaism, to Buddhism, to Hinduism, to any of the -isms of the time. Once a man reaches the age of reason he has to look critically into his belief. I would not become a Muslim because I was born to Muslim parents. I have to ask myself: 'Am I on the right path or on the wrong path?' Because on the basis of that there will be eternity in the life to come, either in paradise forever or in hell forever. Most people in the West either negate religion completely or they follow it blindly, without any criticism.

If I look into the Old Testament, with all due respect, I find many mistakes: linguistically, morally, from the believing point of view, from the acts of worship, from respecting the Creator... many, many mistakes. Historically, many of the stories from the prophets that are narrated in the Old Testament have been completely falsified by the Jews. The name testament is actually deceiving people that this is the testament that Allah has given to Jacob and his descendants to have Palestine as an inherited territory for life. Allah is not a real-estate agent. Allah would give what everyone of us would deserve.

The name 'New Testament' was given by the Jews. The first collection of the Old Testament and the New Testament in one book was made by the Jews. The first commentary in that book was made by the Jews. And the Jews have been brought up with the illusion that they are the elite of humanity. They are the chosen people of God. They are above all other creations. And this does not make sense to anybody. Why should I be above others just because I was born into a Jewish family? These misconceptions have actually misguided many people in the West. And I think that it is high time that people like you, who have the chance to study Islam in depth, try to analyse and compare Islam with the Old Testament and with the New Testament. Try to see the precision in the Qur'an and the illusion in the Old Testament.

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[17] Campbell 1986.

Try to see this for yourself, without any obligation. Because in Islam we believe that 'There is no compulsion in religion'.

SB: Thank you very much, Professor.

ZEN: Thank you!

At the end of this long conversation, that at some points sounded more of a sermon to me, I received as a gift of Professor El-Naggar's autographed volume *Scientific Precision of the Sunnah*. On the way back to my hotel in Amman, the driver was very eager to know about my research and about the *shaikh*, but I answered somewhat vaguely. I felt a sense of vertigo or dizziness for the vast amount of information received during the interview. Most of the content of El-Naggar's discourse had sounded familiar to me, but I wanted to reflect more in depth on its structure, so I was impatient to transcribe our words. However, in the back of my head I had a feeling that something was missing, even if I could not say exactly what. The transcription of this interview as well as Professor Altaie's interview kept me busy for the next afternoons in Amman before taking my flight back to Scandinavia. I constantly felt that some important point had been missed during my exchange with the Egyptian geologist and TV celebrity.

Then, upon re-reading his words, all of a sudden I realized, to my amazement and disappointment, what it was. I had tried to criticize the professor's definition of 'miracle'; we had been almost bargaining about it, but his oratory had overwhelmed me. I had forgotten to ask him about the splitting Moon – did he really believe in the NASA narrative? It was too late.

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CHAPTER 5

It is Light and Darkness

Conversation with Bruno Abd-al-Haqq Guiderdoni

Bruno Guiderdoni (b. 1958, France), an astrophysicist, currently serves as Director of the Observatory of Lyon. Guiderdoni turned to Islam in 1987 (and therefore adopted the name Abd-al-Haqq) after growing up in a non-Muslim yet deeply spiritual environment. Guiderdoni can provide us with a non-native Arabic speaker's perspective on the Qur'an and with a 'Westerner latecomer's' outlook on Islam. Similarly to Basil Altaie, it was Sufism that mediated Guiderdoni's conversion to Islam. He also refers to the fundamental role of René Guénon's work in raising his interest for religion. However, what emerges from our exchange is a position that does not correspond to Traditionalism *à la* Guénon or Nasr. Notwithstanding the role of mysticism in his own religious experience, Guiderdoni does not advocate a fusion of science and mysticism, nor does he seem favourably inclined towards a reformation of science along Islamic principles. When it comes to defining the structure and mechanism of science, Guiderdoni prefers to continue with some prominent Western authors, such as Popper and Kuhn. Guiderdoni is critical towards Bucailleism as well. It is however fully possible, according to Guiderdoni, to reconcile a religious and deeply spiritual identity, with an updated scientific culture that includes biological evolution. Religious feelings and scientific research enjoy complete harmony when they are both driven by the aesthetical contemplation of nature, which, in Guiderdoni's own experience, was conducive to both.

Guiderdoni has led international works of groups of Muslim scholars who reflect on Islam and science, and on faith and reason. Whereas most of his papers are in French, Bruno Guiderdoni has been lecturing worldwide not only on his field of expertise in astrophysics, that is, galaxy formation, but also on Islam and science and on the science-religion dialogue. For instance, in 2008 he delivered the James Gregory Lecture at the University of St Andrews and the Paul Tillich Lecture at Harvard Divinity School. Furthermore, Guiderdoni presented a French television programme called 'Knowing Islam' from 1993 to 1999.

Our conversation took place on 23 June 2011 during a pause from the conference *Belief in Dialogue*, at the American University of Sharjah (UAE). Leaving the building where the conference took place in order to reach our hotel was no viable option, both because of the conference's tight schedule and because of the Emirates' heat, especially since noon was approaching. Therefore, we simply sat at a table in one of the university's wide corridors, dressed in our suits with our name badges, with students and employees constantly walking past the place where we had our discussion. The noisy location notwithstanding, it was easy to get absorbed in Bruno's words.

Stefano Bigliardi: Perhaps we can begin with some intellectual biography. Science, religion and philosophy: how did they interact in your personal development?

Bruno Guiderdoni: I am French. I was born in a family more interested in art than in science, and I was not raised as a Christian, although my father was a Protestant and my mother was a Roman Catholic. I think I had a strong interest in big questions very early. So when I was a teenager I started reading a lot about those issues. There was a parallel growth of my interest in science and in religion. I had no religious training, so it took me some time to discover the nature of my religious questions. It was not clear from the start that I was asking myself the big, fundamental questions of theology and religion: questions on ultimate reality, meaning, good and evil and so on.

SB: Is this the reason why you decided to study physics? Why physics and not, for instance, philosophy?

BG: I was attracted to philosophy but my curiosity at the beginning was rather a curiosity towards nature. I think that probably the 'founding feelings' of my quest were impressions that I got from the contemplation of nature, of the starry sky, of mountains, forests and the sea... They were very strong impressions of the beauty of nature and mystery of nature, the mystery of the laws that rule it, and the mystery that maybe is hidden behind the laws themselves. I was interested in mathematics; I very much felt that I had to study to understand more of nature, and physics was the leading science for that, so I studied physics. Very much at the same time as I studied physics, I became more interested by systematic reading about religions. I was very much impressed in my early 20s by the French writer René Guénon, who helped me understand what is at stake with spiritual life, but I did not clearly understand at that time...

SB: So this was not a 'religious phase'...

BG: No, it was more of an intellectual commitment. This intellectual commitment actually addressed the big questions, and I think that my faith derived from this intellectual commitment. On the one hand, I had these very strong aesthetic feelings for the beauty of nature, and the impression that there was a meaning in things, and on the other hand, there was this intellectual quest, the discovery of the intellectual framework of religion, theology, spirituality; I managed to connect the two aspects and I said to myself: 'OK, my feelings when I see nature are connected to the issue of reality and meaning, and now, thanks to my reading, I have words for these feelings. I will try to walk on a spiritual path.' But it took some time. I was not prepared, even: I was a perfect materialist when I was 12. At 20 it became clear I needed to have a spiritual life.

SB: But still, if I understand you correctly, that was not a Christian faith...

BG: No, at the start it was more disconnected from a specific faith, only after I read René Guénon did I became more interested in Christianity, Judaism, Hinduism, Buddhism, and Islam. Very soon it became clear that Islam was

the way to follow. Actually it's difficult to explain why I made this choice. There are always explanations one can give, but if one continues on the way, one realizes that things are providentially decided in some sense, so it's difficult to give explanations in terms of comparison between the various faiths. Of course, the metaphysical transparency of Islam was very attractive to me.

SB: Would you define yourself a convert?

BG: Yes and no. Yes, I was a convert because, as I told you, I was a materialist when I was 12, and I became very interested by faith in my 20s, and then I committed to a specific faith. In this specific sense I am a convert. But one of the elements of the Islamic faith is the fact that the human being is spiritually created for faith in God, and the knowledge of God, so, in this other sense, I was just turning back to my initial state. Sometimes I tell people that when I embraced Islam it was as if I was coming back home, there was no feeling of being alien to my birth culture, it was completely natural.

SB: What mediated this conversion? Was it reading the Qur'an directly, or was there some author?

BG: I was very impressed by Guénon and by the Sufi path, the spiritual stream of Islam. I read a lot about Islam and Sufism and, at the same time, I was studying physics and astrophysics at the University of Paris. I decided to leave France to live in Morocco. I had this opportunity since I had to perform my military duties by becoming a teacher abroad. I left France to become a teacher in physics at the French High School of Casablanca. I lived in Morocco for two years, with the idea to discover more about Islam, and to embrace Islam – and maybe not to come back to France. My stay in Morocco was quite fruitful. I discovered the Islamic culture, the Muslims, as they live, think and pray. It was more interesting than books. But I did not embrace Islam in Morocco. I was probably not spiritually ready for this leap. I came back to France, I started my PhD work and I specialized in the investigation of galaxy formation, which is now my research field in cosmology. After a few years in Paris, I met a Sufi master who was in the same way influenced by René Guénon, and I embraced Islam at that time, in the same year in which I became a professional astrophysicist by gaining a permanent position at the French National Centre for Scientific Research. The things occurred in parallel ways, but they were disconnected, and it was only after a few years that I felt the need for some kind of connection between my professional practice and my spiritual quest. I became interested in science and religion, and now it is part of my intellectual activity, with two other topics: the interfaith dialogue, and the reflection on the nature of spiritual life in the West, in a society that is secular, and materialistic...

SB: So you grew up in a Christian background – culturally. Did you have any prejudice about Islam? How would you define the phase before knowing Islam? Only ignorance of it, or did you have any preconceptions?

BG: Even if I was not really raised in the Christian faith, my parents prompted me to have a lot of respect for people in general, and for all faiths, so I presume that my prejudices were just linked to ignorance, and I was curious to discover more about Islam. At that time, Muslims were not very visible in France. Now the Islamic community in France is the second largest after Roman Catholicism. Muslims are everywhere, but 50, 40 years ago it was not the case in France. So I had no preconception. I learned about Islam first in books, then by living in an Islamic country, and later by interacting with Muslims in the life of the religious community, and by travelling a lot in Islamic countries.

SB: You said that there was a phase in which the two paths were disconnected. Right now, what is the impact of your faith on your teaching and on your research? For example, when you teach astrophysics, do you constantly underscore the presence of God or do you take a neutral stance while teaching?

BG: I am completely neutral. I do not teach at all any kind of philosophical implications of physics. I think there is little influence on my professional practice, let's say, 'technically'. Of course I try to be as honest and truthful as possible in my everyday work, but these are values that everybody can share, they are not specifically Islamic values. I presume that when I describe those marvellous images of the deep cosmos that telescopes now take, I communicate an aesthetic judgement about the beauty and order of the universe, which probably comes from my faith. I like to transmit a sense of awe in front of these billion galaxies. But mostly I try to be neutral. I do not want to impose my views. There are other ways to communicate my faith. Thus there is no connection between the scientific and the religious practices. However, every human activity, including scientific research, has a spiritual meaning and I try to find some kind of reconnection at the intellectual level.

SB: On an individual level, what do you think of science without religion and of religion without science?

BG: I see that every day. There is the possibility of having a materialistic reading of the results of science. The spiritual reading can be considered just another option.

SB: Do you think that a believer who has no scientific knowledge has a sort of poorer faith?

BG: No, I would not say that, but I think that, without some knowledge, some aspects of the world and society we are living in may be more difficult to understand, because our views on the world are shaped by science, as much as our society is shaped by technology. However, understanding science is not mandatory. I very much think that there are constants in human nature and that we are living now, in many aspects, as we were living 1,000 years ago, we are looking for the same things, we have the same joys and pains, the same dreams. It is the invariant nature of the human being.

SB: You did not approach the Qur'an as a native Arabic speaker. Was that a disadvantage? How did you cope with that?

BG: I learned Arabic and although I am not fluent I understand some of it and I can read the Qur'an. But in some sense I have been told by Arabic speakers (so I just repeat what I heard) that I was very lucky because the only Arabic that I know is God's Arabic, the Arabic used by God when He revealed the Qur'an. I understand Arabic only in the Qur'an and *hadith* (the prophetic traditions) because this is my main reading. I am not reading newspapers... Native Arabic speakers learn Arabic from the TV and newspapers, and some of them have to make an effort in order to understand the Arabic of the Qur'an, which is a specific Arabic. So this is my relationship with the language. But obviously I would like to be more fluent in Arabic to converse more with others.

SB: So you wouldn't define yourself as an expert in Qur'anic exegesis?

BG: No, I think I would define myself as a witness, not an expert in religion. I may be an expert in galaxy formation (or at least I was, because now I am more involved in administrative matters) but I am not an expert in any religious science. I didn't get any specific training in these religious sciences, but I presume I am a witness because of my specific itinerary, and because I can speak as a Western Muslim to Western people. I can speak about my own experience, and bear witness to the doubts about the ability of a materialistic society to make human beings happy. I bear witness to the vocation of human beings for spirituality. When doing so, I try to use what I understand of Qur'anic or *hadith* studies, Islamic theology and philosophy, Islamic mysticism and so on. But I do not define myself as an expert in any of these fields. I try to speak frankly about my life, my itinerary, my beliefs.

SB: Do you think that the Qur'an contains obscure parts?

BG: Yes. It's light and darkness. And it has to be like that, because it is the same with our world, which is partly intelligible and partly unintelligible. There are puzzles in the world, there are puzzles in physics, there are puzzles in the things that happen. The Qur'an is like the world, so it is partly intelligible, because God explains Himself and teaches us things about His own reality, His names, His attributes, His Creation, the afterlife, and it is partly darkness and mystery, because God does not give us all the answers. He wants to lead us to Him who is the answer. There is a *hadith* saying that we are separated from God by 70,000 veils of light and darkness, and one can interpret the *hadith* by attributing these veils to the world, to our own soul, or to the Qur'an. Sometimes you are illuminated by reading the Qur'an and sometimes you are puzzled by it, it leaves you perplex and dismayed. The same verse can have these very different kinds of influence.

SB: Do you feel any difficulty in connecting the God of the galaxies you are an expert of and the God of the Qur'an, the God of the 'small things', the God who intervenes in human vicissitudes?

BG: No, not at all, because I think that the creation is perfect. God is the perfect Creator and this is the reason why there is no flaw in the Creation. One of the verses of the Qur'an challenges the reader 'Do you see any flaw in the creation?' (67:3). There is no flaw in the creation. Things behave perfectly according to the laws, the regularities that we see in nature. We understand the world as a perfect creation that hides God. We can see also the opposite, God revealing Himself through things. So God is present. He recreates the world at every instant, with regularities and consistency. Consistency is a veil that hides God and in some sense allows us to see God behind a veil. We do need to see God behind a veil; otherwise we would be destroyed by His light. So there is no intellectual difficulty in connecting the intervention of God in the large scale and in the small scale, even if it is obviously very difficult to get the actual awareness that this is happening at every instant. It is the definition of sainthood: to be able to see God active in things at every instant.

SB: But one can have some difficulties in connecting the God of the physicists and...

BG: ...a personal God?

SB: Not only that, also a God who gets busy with our daily business, so to speak. The God who is there to judge us, to follow us... I mean, if He is behind all that, the galaxies and so on...

BG: Yes. My own personal cure for this doubt is to have the highest idea of God. You know: *Allahu akbar.* 'God is the greatest.' He is so transcendent that obviously He can create the universe without being exhausted by any single piece of space or time. I have no difficulty whatsoever to accept that the universe can be spatially infinite and eternal as well, because God is not exhausted by His creation. God is 'more infinite' than the infinity of space and time. Because of His transcendence, He can create and recreate anything, and simultaneously He can be immanent, He can be interested by any of us, without being affected. We have to keep these two aspects of transcendence and immanence in order to have the highest idea about God. If we think He is only transcendent, then He is too distant, and God is just a concept. If we think He is only immanent, then He is a kind of 'cosmic energy' or He is just 'the things'. But He has simultaneously these two qualities. I know that He is present even if He is also the Creator of the world. Because this transcendence associated with immanence is not a 'conceptual transcendence', it is dealing with ultimate reality. Ultimate reality is like that: it is very distant and very near. So I have no difficulty to imagine that God is present, that God knows, that God is active in my life, but I know that He is not a 'thing' which is intervening among things, a being intervening among beings. He is more subtle and more fundamental than that.

SB: Was your conversion received with scepticism in Muslim and in non-Muslim circles?

BG: I think that when I embraced Islam the people around me – my family, my friends – understood my choice, because I was interested by spirituality

before making this step forward. I was not received with scepticism or with aggression by my family and my friends.

SB: What about the scientists?

BG: There was a period during which my conversion was not known by my colleagues. But after a few years, I appeared on the TV screen when I became the presenter of the Islamic programme on the state channel France 2. I was openly saying that I was Muslim by that time, and all people discovered my faith. I had a few comments from colleagues who were willing to discuss spiritual or philosophical issues. However the majority of my colleagues were simply not interested.

SB: Besides comments you didn't have any difficulties professionally?

BG: No, at least no apparent difficulties. However it is possible that there is some kind of '*plafond de verre*', as we say in French, an invisible glass ceiling that prevents you from having access to responsibilities, like for ethnic minorities or for women.

SB: And in Muslim societies you were never received with scepticism.

BG: No, you know, the converts are received as examples. There is the idea that everybody should be Muslim because Islam is the 'original religion', and Western converts are examples to be followed. The problem appeared later, when I started to have views about aspects of Islamic faith or life, and obviously there are streams that are not similar to the one I try to follow. But I was not accused of being a convert. I may have been accused of being a Sufi for instance, but not a convert.

SB: I would like to discuss your stance towards other religions. Do you think that Islam is compatible with science because religion in general is compatible with science, or because Islam has a privileged relationship with science?

BG: I think that in general religions are compatible with science, because religions mostly deal with meaning and salvation, and they do not care about the details of the world. Of course, it doesn't mean that there is no tension. I do believe that there are tensions, and that these tensions can be positively used in our lives. I do not think that there is a state of complete peace between science and religion. There are tensions, but they can be seen as ways of going ahead on the path of science, as well as on the spiritual quest. Is there any specific pattern of Islam that makes it more sympathetic with science? Sometimes one says that Judaism is about being faithful to the law, Christianity is about loving the other, and Islam is about searching for knowledge. So the emphasis Islam places on knowledge is clearly a specific aspect that makes the dialogue between science and Islam very interesting.

SB: ...But it is a matter of more emphasis, it is not a privileged compatibility, like Islam is the religion that is exclusively compatible with science.

BG: No, Islam is not privileged. This standpoint is sometimes defended by some Muslims, who claim that Islam is the only religion that is purely rational, and consequently the only one that is suited to modern times. I do not share this idea. I think that Islam puts the emphasis on knowledge, which clearly has to be searched at all levels, and this includes rational and scientific knowledge, but it is the teaching of Islam, as well as of other religions, that the knowledge we are called for is not limited to rational knowledge. Through ritual practices, we can know much more than what we can understand rationally.

SB: What about non-Monotheistic religions, since they do not share this principle of unity of God?

BG: Yes. I very much believe that all religions have started with that single principle, even if they do not have a personal God, which is a specificity of monotheism. But behind the personal God who speaks to prophets in history, there is the divine essence. Hindus for instance have this doctrine of the divine essence, Brahma. Even the Buddhists, who do not affirm the existence of God, which is a non-subject for them, speak of a spiritual state, which to me seems very similar to the states that are described by the saints of all monotheistic religions. We are basically dealing with the same kind of experience. So I do not think that there is any specific problem for Buddhism or Hinduism when it comes to science. It is just a matter of putting the emphasis on various aspects of reality.

SB: We know other scientists who are engaged in the development of similar theories of the compatibility between Islam (or religion) and science. Do you feel part of a collective enterprise? Do you see any major differences?

BG: It's a collective enterprise. There are scientists with various standpoints on what science is and there are various streams in Islam, so clearly there are differences, but it's very much a collective enterprise, because we are facing challenges in the twenty-first century. Islamic societies are shaped by science and we have to define ourselves with respect to science, and more globally we have to define ourselves at the level of the big problems of humankind, such as the environmental problems. All this reflection is part of a collective endeavour.

SB: So you would say that your enterprise is very similar to that of your colleagues.

BG: Yes, we all want to show that it is possible to be a Muslim and to be a scientist, that the Islamic community has to be part of the great adventure of scientific discovery, and that our intellectual path can be nurtured simultaneously by science and religion, because science is uncovering the world, or at least part of it, and it's very important for us as Muslims to know what the world exactly is, or what it is not.

SB: How do you judge the so-called Islamization of science?

BG: I am quite sceptical about this possibility. Because these are constructions that are made *a priori*, they do not correspond to the actual scientific practice in laboratories. In addition to this disconnection with science as it is made, there are many things that can be put under the label 'Islamization of science'. Some may be interesting but some are mere ideology without any relevance.

SB: But in general you don't believe in the possibility of re-casting science with Islamic principles.

BG: I think that this can be done in some way. I have been quite convinced by the post-modernist arguments about science as a construction, especially the works by Popper, Kuhn, Feyerabend, Lakatos[1] and others, who underline the influence of society and ideology on science. Clearly there is this aspect, but the efforts, which have been made to Islamize science from general principles, were, I guess, poorly convincing in terms of efficiency. Now if in the future we have societies that are inspired by Islamic principles and which are able to develop the scientific pursuit effectively, I presume that the topics that will be addressed will be influenced in some way by Islam. But I doubt there will be a coherent enterprise of re-making science from scratch with a set of Islamic principles. A religion is not made for that. It is made for salvation. And when Islamic science developed during the golden period of Islam, under the caliphates, there had not been such an attempt to Islamize science, apart from the general prospect of unifying all knowledge under the knowledge of the uniqueness of God, which is the basic tenet of Islam.

SB: What do you think of Bucailleism, past and present?

BG: Of course, as a Muslim, I believe that the Qur'an is an intellectual miracle, so I cannot exclude *a priori* that there are allusions to natural facts. Actually *there are* allusions to natural facts. When I read books about *i'jaz*, my concern is the strong interest that is put on science, and the fact that the beauty and truth of the Qur'an are seen as in need of being proved by science. I think it is a complete inversion of the way things should be done. It's very surprising to see people who are interested in the material interpretation of the verses of the Qur'an: they do not understand that the language of the Qur'an is made of symbols, parables and myths. This language is alluding to spiritual realities, that is, to things that cannot be described by rational language. The defenders of the 'scientific miraculousness' of the Qur'an are trying to extract scientific statements from these verses. All the arguments, which are given, are very poor. I think that they show bad science and bad theology.

SB: What about Maurice Bucaille? Did he play any role in your conversion or interest in Islam?

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[1] Karl Raimund Popper (1902–1994), Austro-British philosopher of science; Thomas S. Kuhn (1922–1996), U.S.-American historian of science; Paul Karl Feyerabend (1924–1994), Austrian philosopher of science (1924–1994); Imre Lakatos (1922–1974), Hungarian philosopher of science.

BG: Absolutely not. I met him a few years ago, before his death. I think he was quite honest in writing his books, because he was just listing all the allusions to natural phenomena in the Qur'an. At the end of his book, he concludes that it is surprising that there is not a single error in the description of these natural facts. The whole trend of *i'jaz 'ilmiy* comes from the idea that it was impossible for human beings in the seventh century to have these correct views about nature. This is controversial, because the Bible and the Qur'an are separated by 1,000 years and, during that long period, science has developed a lot, especially thanks to the Greeks, and it is possible that the vision of the Qur'an just echoed the vision of the men in the seventh century around the Mediterranean area.

SB: But on a personal level you think that Maurice Bucaille was sincere.

BG: He was sincere but he was surprised, I presume, by the success of his book, and later on, the people who tried to force the interpretation were less sincere than he was, I assume, because the arguments they put forward are very poor. This is the reason why *i'jaz* is eventually self-destroying. It is because of the poorness of the work and the shallowness of the aspiration, which are behind this search.

SB; What is the importance, for you, of the philosophy of science and, more in particular, are there any authors who influence you or influenced you more than others, in Muslim and non-Muslim tradition alike?

BG: As I mentioned, Karl Popper, Thomas Kuhn, Paul Feyerabend, Alexandre Koyré,[2] all these authors were very useful, at some stage, to make me have a broader view about the philosophy and history of science, and the long story of scientific discovery with a lot of influences back and forth from society, religion, philosophy and so on. The existence of such a network of relations legitimates the dialogue between science and religion. When I was a student, science was taught in French universities as an isolated set of ideas and principles. But, thanks to these authors we learn that science is a human construction that has discussed a lot with other human constructions. The history of philosophy of science helped me understand this perspective.

SB: What about the state of scientific education and scientific culture (meaning also the interest, or curiosity of a general public towards science) in France (or Europe, if you want to expand on that) and in the Muslim world? Can you make a comparison thanks to your special point of view?

BG: I think I am very lucky because astronomy and astrophysics are appreciated by the public. Just a few days ago, there was an open day at the observatory of Lyon, with lectures and exhibitions. We had 3,000 people in two days. I myself have lectured on the multiverse. People expect to see beautiful images of the universe and to understand it. But the popularization of science is not easy. There are a lot of misunderstandings of the concept of science, especially of *modern* science because it is not *common* science. For

[2] Alexandre Koyré (1892–1964), Russian-French philosopher of science.

instance, it is very difficult to make people understand the paradoxes of the infinite or finite universe, in cosmology, or to popularize the principles of quantum mechanics such as uncertainty or non-locality in physics. Yet I cannot see any specific problem in the Muslim world. I have given this kind of lecture in many places, for example in Algeria and Morocco, and I have not seen any specific problem arising from a lack of interest in science. At the end of the lectures, there are always questions about the meaning of it all, what was there before the Big Bang, why are there laws, whether I believe in God. These questions come very frequently but they are quite similar in the West and in the Muslim world.

SB: What about the state of scientific education?

BG: People who come to the lectures are very interested, but it is true that generally speaking, the interest in science is decreasing in the West. You have probably heard of the decrease of the number of students in science in all developed countries and that it is a real concern because science is not valued as it was a few decades ago. After all, science is one of the major shaping forces of the world and now it is not viewed as a thing that is worth being studied because it is too difficult and the careers are not interesting enough in terms of money. So you'd better study technology, or trading, or business, or cooking. But there is probably more interest in science in Islamic societies. I think that the incentive for searching knowledge is still very strong because of the message of the Qur'an and *hadith*, and people are interested in science because they are still rooted in spiritual principles. So there is a field for improving the popularity of science in the Islamic countries although it is not done properly now, probably because of the failure of the educational system and the meagre development of the cultural background (especially books and newspapers).

SB: Are you aware of the criticisms to the idea of compatibility between Islam and science?

BG: I see various levels of criticism. There is Ernest Renan[3] for instance, and all his successors who claim that Islam is obscurantism. There are also people in the Islamic world who say that some parts of science are compatible with religion but there are other parts (like the theory of human evolution) that are not consistent. There are these oppositions but most Muslims would probably accept the idea of compatibility in general. After that, I am afraid there is a poor understanding of what a scientific theory is, that is, let's say, much more than a simple opinion, but probably less than an absolute truth, the definition of which became fuzzier during the developments of the philosophy of science in the twentieth century. Or are you thinking of a more specific comment on some aspects this opposition?

[3] Reference here is to Ernest Renan's criticism of the compatibility of Islam and science in his 1883 lecture (Renan 2011, briefly touched upon in the notes to the *Introduction*).

SB: Yes, I was first of all thinking about the criticisms levelled at the trends we have previously discussed, the Islamization of science or *i'jaz* alike, according to which the development of this kind of theory is an expression of an inferiority complex. People are looking for this kind of compatibility in order to compensate…

BG: Yes, I think it is probably a correct analysis from a psychological point of view. There are maybe also sociological interpretations. I think these trends may be considered as pathologies of the dialogue between science and religion. What is very interesting is that it also happens in other faiths. For instance, in the Hindu community there are people who interpret the Veda in the light of modern science, claiming that there are descriptions of nuclear power in these holy texts. So it is a pathology in all religions.

SB: But this does not affect your discourse?

BG: No, of course I meet these people in lectures and conferences, in the audience. There are frequently asked questions about the compatibility of biological evolution with Islam, or about *i'jaz*. If people are not too aggressive, it is easy to show them that there is another way of addressing the dialogue between science and religion, and that *i'jaz 'ilmiy* may be considered just as the infancy of the dialogue.

SB: Are you afraid of any ideological exploitation of your work? For example, that some advocate of *i'jaz* may quote you…

BG: Yes, that happens. I have no way of controlling that, especially on the Internet, where some of my papers are quoted without any permission…

SB: …As the 'famous French scientist'…

BG: Absolutely, yes, 'the famous French scientist who says that…'. They are using that for all kinds of purposes unfortunately, but that's the Internet…

SB: Now, there are religion and science as systems of belief but there are also religion and science as represented by specific institutions. What do you think of the relationship between them and how can it be improved, for example if the clergy issues a *fatwa* about a specific scientific issue, and that can affect the behaviour of a scientist, restrict his activities and so on, that can be a problem… How do you see that?

BG: Of course it can be a problem. It is a question that is very broad. In France, for instance, the situation is clear. There is no relationship whatsoever between scientific institutions, which generally depend on the State, and religious institutions, because of the specific way the French understand secularism. The interactions are very rare. But I can give one specific example. It's about the determination of the month of Ramadan; there is always this debate whether the date can be computed, so we see at least three levels of institutions which are acting with or against each other: the *ulema*, who are in charge of deciding from the principles of the religious law, the astronomers, who are consulted and make the computations and the ideological powers of Islamic countries that try to acquire leadership over other Islamic countries.

We see a very complicated interaction between these three levels, with outcomes that are sometimes very surprising: the month of Ramadan that starts not at the correct time with respect to astronomical evidence. Clearly there are problems.

SB: What about ethical issues?

BG: Bioethics? I do not follow that deeply. I am not an expert, so frankly I cannot answer your question, but yes, I presume that there are problems, just because one major principle of ethics is that one should not do all the things that one *can* do. Obviously science can do a lot of things, but surely it is not possible to do them all. For example, I have heard debates about human cloning or transhumanism and I am quite perplexed by these issues, as by everything which touches our human nature…

SB: But in general do you think that the clergy – meant in a broad sense as religious leaders – should improve their scientific competence?

BG: Yes, clearly, otherwise we give importance to statements that are not based on facts. The clergy needs to improve their judgment. In general the traditional religious leaders in the Islamic world are not well trained in these issues, and this is the reason why, in the debates that are taking place about the training of religious leaders in Europe, and for Europe, we are reflecting on the possibility to include some science curricula into the training, and especially the debate on science and religion. We feel that it is absolutely necessary to have religious leaders who are prepared to address these questions.

SB: We come now to a very specific topic, which is, miracles. What is your stance towards miracles, for example, the famous splitting of the Moon? How do you interpret these supernatural narratives in the Qur'an and in the Sacred Scriptures in general? In a metaphorical way, in a literal way? Do you have a problem with that? Do you make a distinction between Qur'anic and extra-Qur'anic miracles, like those of Sufism, where there are a lot of extraordinary and maybe supernatural things going on?

BG: For me, there are three interpretations. First, for Islam, as far as I understand it, the main miracle, the foundational miracle, maybe the *only* miracle, is the intellectual miracle of the revelation of the Qur'an. The fact is that this book, written by God, is given to a human being, the Prophet Muhammad, who is illiterate, and the beauty of language was recognized by the contemporaries of the Prophet as 'supernatural'. This is the original meaning of *i'jaz*. This can be acknowledged only by those who speak Arabic, obviously, but it is a beauty to which we can be sensitive even if we don't speak Arabic, because of the rhythm and music of this extraordinary language. This is *the* miracle. Then I can understand miracles according to a second interpretation, as coincidences of causal chains that are apparently disconnected. I will give you an example. I am looking for money for improving, let's say, the Mosque of Lyon. I desperately look for it and I do not find it. Someday a man comes to me and tells me that he has a lot of

money and he wants to perform the *zakat*. He asks me if I have a project to fund and he gives me the money. Then five minutes later another man comes and tells me that he can add some more money to complete the same project. Well, this does not happen to me unfortunately, but it is an example of things that are completely disconnected. If they happen simultaneously, there is nothing against the laws of nature, but it is unavoidable that, if you have faith in God, you consider them a miracle or the intervention of the Providence.

SB: This can be interpreted in perfectly physical terms. But what about the supernatural?

BG: Absolutely. This is the second interpretation: these are signs of divine providence. These are miracles, in some sense, because believers read God's intervention into coincidences that respect the laws of nature, but that are unexpected events with a meaning.

And then there is the third interpretation, that of miracles as facts in which the laws of nature are not respected anymore. At that level, I would be quite careful; my natural trend would be to interpret the verses of the Qur'an in a spiritual way. For instance, for me the splitting of the Moon represents the splitting of the heart of the believer, during the eschatology, the fact that the secrets hidden in the heart will be unveiled, at the moment of the ultimate hour, because all the things, which were hidden, become apparent.

SB: So you do not interpret it as a physical fact.

BG: No. That is my own interpretation. Of course, I cannot deny the possibility that there is also a physical meaning. Does it mean that the natural laws are held or is it an allusion to facts that are going to happen in the future, or which happened a long time ago? You know, there are people who have interpreted it, in the *i'jaz 'ilmiy* or in the scientific commentary of the Qur'an (*tafsir 'ilmiy*), as an allusion to the formation of the Moon when the Moon was separated from the Earth about 4.5 billion years ago! Of course, for a believer, God can change the laws of nature, although He deliberately chooses not to change them, because the miracle of the regularities in creation is higher than the miracle of changing the laws at will. But, as miracles by definition occur only once, it is not something that can be investigated by science, which needs repeatability.

SB: So you don't believe in supernatural events related to Sufi masters for example?

BG: No, I don't say that. My position is to state that the laws of nature are constantly valid, because the regularities represent the miracle of God's creation. Scientists do not understand why the laws of nature should hold constantly. The fact that mathematical laws govern nature is quite puzzling. These mathematical laws are the very substance of matter! This is the miracle, and then, of course, since everything that occurs in the world unveils God's signs, as I stated previously, there is always the possibility that things behave differently if God is willing but I am refraining from the idea of seeing God intervening as an agent, a thing, or a being in creation because I think that it

is a statement that lowers our idea of God. Once this is said, I accept the possibility of miracles.

SB: So in the transcendence of God you find space for miracles.

BG: Yes. It is a metaphysical point of view. Otherwise God would be submitted to His own creation. On the other hand, since the laws of nature are the manifestation of God Himself, we should not say that miracles constantly happen or are constantly possible. It's a very delicate point. In any case, science cannot say anything about miracles because they are single events and science speaks about events, which can be repeated, so there cannot be any kind of rational discourse about them. Miracles never repeat themselves twice. There are just single moments in the history of natural laws. They cannot be repeated; they only have *meaning*. Nothing can be said about them except from a spiritual point of view.

SB: Do you see, as a scientist, other sources or modalities of knowledge of God besides science and the scriptures? More specifically, do you believe in mystical experiences?

BG: Yes, very much. I was influenced by the Sufi way, as I said, and I do think that it is possible to have a direct experience of God. One symbol is the veil: the cosmos we see cannot be separated from God. It is God's will, God's manifestation that we are seeing, so God is present, God is near. If we do not see Him, it is our fault because we have veiled ourselves. Sometimes the veil is taken off. It is possible to have some kind of feeling, intuition or knowledge of a deeper presence and that is a spiritual experience. I cannot say that I have that very frequently but from time to time I have – like many others, I presume – some kind of feeling of the deep meaning of existence. These intuitions are very important and they can be related to miracles because spiritual experiences also are single events, like miracles. It is very difficult to talk about them. By nature, they lay beyond words, descriptions and theories.

SB: Darwinian evolution is often used or presented nowadays as the main scientific theory that clashes with religion. What is your stance?

BG: I fully accept evolution. It is so beautiful to think that the world evolves and changes, and that new things constantly appear in creation. I am professionally dealing with cosmic evolution from the Big Bang to the formation and evolution of galaxies, with stars and planets. This is my research field. After cosmic evolution, and in parallel with it, there is obviously biological evolution, including human evolution. I have no problem with these scientific facts. As I scientist I also presume that the theory of evolution, such as the cosmological theories, is not closed: we are now encompassing the Big Bang theory into a broader scheme, that includes new ideas such as the multiverse, or pre-Big Bang cosmologies. I presume a new view could appear in the theory of evolution, such as epigenetic influences of the environment on the expression of the genes. I fully accept the scheme of evolution. But I have a theistic interpretation of cosmic and

biological evolution: what we call chance is only our ignorance of causal chains.

If we believe that all causal chains ultimately come from God, there is no problem in having a theistic view of evolution. It's just a way in which God is acting in nature, a specific expression of the range of possibilities by random mutations which shape life forms, and it is also possible that specific life forms are preferentially selected, according to the idea, advocated by Simon Conway Morris,[4] of convergent evolution. Some life forms are more fitted than others to a changing environment. Maybe the process of appearance of an intelligent creature is unavoidable, because our brains are so efficient in terms of natural selection. Once nature has found something like brains, it necessarily explores this possibility further.

Now, a new element that has to be considered is the very large number of Earth-like planets that probably exist in the universe. It means that even if many of these planets may be without life, there are so many possibilities for life to appear. The appearance of creatures made for worshipping and knowing God is something that may be unavoidable. The meaning of the world is to harbour intelligent beings who are able to observe it and praise God for creating it. Such creatures may be unavoidable in the large cosmos that we are now seeing in cosmology. I have no problem with biological evolution, and even with Darwinism, (that is, with evolution governed by chance gene mutations) and necessity (selection pressure). Of course, there are aggressive interpretations of Darwinism, which are struggling against religion. Such interpretations have to be recognized in order to better understand the landscape, because otherwise, if we assimilate altogether science, biological evolution and Darwinism, with the interpretations proposed (or imposed!) by materialism and atheism, there is a kind of confusion which can lead us to reject science indiscriminately, as imam Al-Ghazali was already saying 900 years ago. The constructive dialogue of science and religion is useful to help people make the difference between scientific theories and their interpretations, even if, as we know after Popper, Kuhn and Feyerabend, they interact very deeply.

SB: What about quantum physics, which I have often touched upon with your colleagues? Do you see any problematic issues as to religion and science?

BG: No, on the contrary. One of the discoveries of quantum physics was non-locality: the fact that the entities of quantum physics are non-local. If you want to stick to reality, to think we are describing something, which is reality, you have to assume that reality is non-local, that is, beyond the categories of space and time. That's very surprising for Western minds, which have been used to cutting things into small pieces in order to interpret them. But in cultures that emphasize the underlying unity of the apparent diversity – Islam for instance – there is no problem at all in terms of mind shape to accept the idea that things are non-local, according to theory and

[4] Simon Conway Morris (b. 1951), English palaeontologist.

experiments. At that level, the philosophical interpretation of scientific results does not produce any kind of tension with all the faiths, which have this idea of an underlying unity.

SB: What is your agenda for the coming years? Not in terms of practical commitments, of course, but in terms of theoretical problems you would like to solve or at least to take up.

BG: Professionally, I will be involved in observing programmes of distant galaxies, which are observed as they were at the time of their formation, 10 billion years ago. As far as science and religion are concerned, I will write a couple of books to propose sets of arguments and reflections on science and religion especially about cosmic evolution in the context of contemporary astrophysics and cosmology, because there is a need for specialized textbooks in the Islamic world. There were many books on general issues about science and religion in Islam in the past, but there are few studies that go deeper into specific science fields.

SB: What about specific topics? What do you consider especially problematic?

BG: Probably the description of the universe made by cosmology. The cosmos is so large, so old, so diverse. How could these features be interpreted in religious terms? Then there is another issue, which is more problematic: the apparent fine-tuning of the properties of the universe that have made the appearance of complexity possible. This fine-tuning is a pleasant surprise for all monotheistic faiths because the universe seems to be 'tuned' for the existence of life, but there are scientists who are trying to interpret it as just the realization of a natural random process in a broader multiverse, and there are strong arguments for the existence of the multiverse. For some of these people, the idea of the multiverse would simultaneously evacuate the ideas of fine-tuning, design and God. This is the crucial issue that I would like to address: to propose an assessment about the theory of the multiverse and to show that there can be a theistic reading of it, as there can be a theistic reading of Darwinian evolution, that is not going to challenge our views about God. On the contrary, it gives us a broader view about the process of creation and the diversity brought forth by God. That is the challenge for the coming years.

SB: ***Merci beaucoup*****, Bruno!**

BG: *Merci beaucoup*, Stefano!

Right after the conversation, Bruno Guiderdoni and I returned to our duties as conference delegates. I was especially happy for having collected one more perspective on Islam and science, and fresh suggestions regarding the concept of miracle.

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CHAPTER 6

A Reconstruction of the Two Sides

Conversation with Nidhal Guessoum

Nidhal Guessoum (1960, Algeria) is a Professor of Physics at the American University of Sharjah (UAE). He obtained his MSc and PhD degrees from the University of California in San Diego. Guessoum is particularly engaged in the application of astronomy for the determination of Islamic holy events and he has recently established himself as one of the most authoritative and better-informed contributors to the debate on Islam and science by virtue of his overarching monograph *Islam's Quantum Question* (2011). A major critical target of Guessoum's is the literature dedicated to the 'scientific miraculousness' of the Qur'an, which, in his view relies on and encourages a misunderstanding of what science is really all about and distorts the meanings of many verses. Moreover, he rejects any attempt at 'Islamizing' science: science, Guessoum points out, is already clearly and universally defined, its method needs to be correctly grasped and taught, and is in no need of any 'conceptual infusion' whatsoever. Whereas he fully accepts biological evolution, confident as he is in the possibility of harmonizing religious concepts with biological ones, Guessoum rejects miracles meant as supernatural events. The miracle of the Qur'an, he maintains, is its constant openness to new interpretations.

Our conversation took place in two very distinct moments. The first time I met Professor Nidhal Guessoum at his office in Sharjah was on the eve of the conference *Belief in Dialogue* on 20 June 2011, after a long, friendly and instructive e-mail exchange on Islam and science. I had some difficulties in locating his office, and after having walked around for some time in the campus in the sweltering summer weather of the Emirates I was almost out of breath. Nidhal welcomed me heartily and we began our conversation after a short meal in the university's dining room. We were occasionally interrupted by phone calls and by people knocking on the door: indeed it was very generous of Nidhal to give me some of his time at a moment in which his commitments as a conference organizer had reached their peak. I was determined to dig further into some issues that Nidhal's recent monograph had left, in my impression, somewhat open. As further scholarly collaboration would confirm, Professor Guessoum has a gift not often encountered in academia – he is namely what I would call a *severe friend* – as much generous with his time as forthright in defending his views and pointing out inaccuracies in his interlocutors' words. The second part of the conversation took place virtually, as a teleconference. I was logged in from my office in Lund, Sweden on 17 September 2011. This was perhaps less fascinating than all the travels to the Middle East I had embarked upon until that moment in order to write this book, but I thought after all that a discussion via video was

also an appropriate conclusion for an investigation about Islam and modern science.

Stefano Bigliardi: I am familiar with the stages of your career as a physicist. I would like to know more about the interaction in your life between faith, philosophy and science. If we would depict them as three lines, are they running parallel, are there ups and downs, were they converging at specific times?

Nidhal Guessoum: I think these three lines were always intersecting, and at some point they started to converge – or to merge. But they were always there and they were always intersecting. I grew up in a moderately religious family by Muslim standards. By Muslim standards, of course, all families are religious, meaning they practise Islam. People pray, most of the time, almost everybody fasts, etc. Islam is part of the family and of the social fabric. I grew up in such an environment. My father, just to go back a little bit, already had two of these lines almost well merged in him, because he was trained in both philosophy and Islam from an early age. In fact, he memorized the Qur'an as a teenager, which is not an extraordinary achievement as it is somewhat typical of young boys of his period. He had already memorized the Qur'an and he had already mastered some of the fundamentals of Islam, and he had studied some of the main topics of Islam. But when he went to university he specialized in philosophy and literature, so you can see those intermingling already. Later on he did a master's thesis on Averroes, so that shows you the influence on me later. The only dimension that is missing in my father is the science dimension, which he was never trained in. He never received an education in what we call modern science; of course he learned logic as part of the training in philosophy, but nothing in the sciences. So he never understood physics, he never understood biology, chemistry, geology or astronomy or any of them. When we grew up, my siblings and I, we were immediately given a dual education: bilingual education at least, so we were fluent in Arabic and French from the beginning, we were learning most of the traditional disciplines in Arabic, and all of the modern disciplines in French. So you can see tradition and modernity being fed to me from early on.

SB: And you did not feel any struggle at that time?

NG: The struggle came later, because you only start to feel the struggle once you start to understand science properly and once you have started to study some serious philosophy and started to look at some serious discourse. But if things are given to you just superficially, and you are given some nominal explanation of how things relate, and you are too young to question or to really see the flaws in the construct, then there is no clash. The moment you start to really see the details of it and that it is not quite logical or quite strong as a relation then you start to see the tension. So the tension did occur later, definitely.

SB: So there was a moment of merging and tension at the same time.

NG: It was mainly the question of science. What science says versus what the Qur'an says for example, or what the classical Islamic discourse says. You know, sooner or later, once you really start to study things rigorously, you start to see that you either need to separate the two and never try to merge them, or you try to bridge the two coherently. But then you have to interpret something and you have to soften one idea here and you see that things need to be reconsidered, reinterpreted, that something doesn't need to be believed, etc. So you reconstruct the two sides in order to find a fit. I think it was only after I went to the States, after my undergraduate studies, that I really started to see that this needs some serious reconsideration because I started to reinvestigate and to see certain new ideas and new topics that I had not seen before, or things that I had dismissed, like evolution, for example. Typically in the Muslim world today, even my students say that evolution is not a fact: 'It is not confirmed, it is just ideology, so you do not have to worry about it…' Then when you confront it, when you read a book that shows you all the evidence, you think, 'Oh my God, I can no longer say that it is just a theory and there is no proof'. Then you say, 'I have to take it seriously, but how do I do it with my religious beliefs?'

SB: So when was the peak of this struggle? Did it coincide with being exposed to a specific theory? Was there a moment in which you felt that your faith was more jeopardized than ever?

NG: It's not the Muslim faith altogether. It is a certain understanding of Islam. So it's not like OK, now are you really going to drop faith and turn agnostic or atheist, it is not like that. It is more: 'My conclusion from trying to fit everything is that my understanding of Islam needs to change'. Or 'I was reading these verses and taking them for granted this way but now I need to go back and take a new look'.

SB: So it was a moment of critical reconsideration.

NG: Right. Critical reconsideration and the moment of realization that the way I have been looking at it is only one-dimensional, simplistic and that there are other Islamic traditions. See, one of my biggest discoveries in my intellectual career is that Islam is really a big spectrum. Islam is not 'It is as I am giving it to you'. Islam is all of this. There are thousands of Islamic books. There are many viewpoints. And there are many attitudes. And you go back and you find 1,000 years ago people were already debating all of this. People who do not accept miracles as physical phenomena are not completely new. It goes back 1,000 years ago. Some people were saying, 'I do not have to take miracles as physical manifestations, there is no violation of physical causality', for example. Plus you really start to take science and the cultural history of the world more seriously. That is another dimension that is not always appreciated and Muslims, including Muslim intellectuals, tend to downplay the cultural and intellectual traditions of others. They'll say: 'This is from Westerners, so what do you think?!' 'This is existential philosophy, so you do not even have to read that!' 'This is Descartes' dualism, so of course …'. I have to contend with it, I have to argue with it, and maybe it says something

that I have to really respond to or I have to integrate it. So once you take that step and start to consider science and philosophy as a human production that needs to be taken seriously, then that is when you get challenged into reconstructing your Islamic identity in a new way.

SB: Was there a time in which you were fascinated by the discourse regarding the so-called scientific miraculousness of the Qur'an, a moment in which this kind of discourse was playing a positive role for you?

NG: Sure! Yes, absolutely. I cannot lie about it, and I cannot deny it. On the contrary, I think that it is not only honest, but it is constructive to admit it to others, just to show that I understand that others can fall for the attraction of these things. But I also understand why and how one must get out of it, and the reason why I was attracted to it and I thought that it was impressive and right and true…

SB: Can you name at least one author?

NG: Maurice Bucaille to a large extent. It was in fact during that time that this discourse became very public and very visible and popular. Bucaille's book came out in 1976. In 1976 I was 16 years old, I was in the middle of high school. And my father, who as I already said is a philosopher, had just seen the book and bought it in Paris. Since we all speak French fluently, I read it immediately, because I was interested in all these topics, and I thought, 'Wow, this is impressive! I mean, this is a French medical doctor, he knows what he is talking about, and he has examined the Bible and the Qur'an and he knows his science, and look what he is saying!' And then there were many authors, some of them are less well-known nowadays, Bashir Turki, just to give one example of a Tunisian fellow, who was also a nuclear physicist, a university professor, who had been at that time writing books and giving lectures of this kind, explaining that, you know, that there are verses in the Qur'an that explain that there are atoms, and that the structure of the atom is similar to pilgrims going around the Kaaba in Mecca, things like this…

SB: So there was a phase in your intellectual development in which Bucailleism played a positive role and this makes you more sympathetic towards it.

NG: Not more sympathetic towards it: more understanding towards its allure, why it is fascinating to people. And the reason is that at that time my understanding of science and philosophy of science and history of science, even if I was an excellent student of science and I ended up specializing in science, was very weak. My understanding of science in high school was just the formulas, the experiments… I had no understanding of the evolution of science, and what gets discovered, and how, and what science is really saying.

SB: So it was university education that made you drop it.

NG: Yes. It made me see that this discourse is simplistic at best. I saw that it was maybe for the masses, for people who can take this and be impressed by this, but I know better now, and I cannot, honestly, accept this. And then

later I started to see the danger in this approach. At some point I started to see (and this is also another idea in Averroes) that there are several levels of discourse by humans for humans. Averroes sees the philosophers as the élite, and their understanding is detailed, their methodology is rigorous, and thorough, etc. And then there are the theologians, who are the middle ground, the middle class, who can argue back and forth, dialectically, and then there are the preachers, who are the lowest class of thinkers and speakers, who use mostly rhetoric – they say things that sound great and the public will just take it. So my second phase was that I am now moving toward the higher level, the scientists for me are like Averroes's philosophers and so their understanding and their methodology is of higher calibre, so I started to think that I could not accept this 'scientific miraculousness of the Qur'an' nonsense, but I can understand that the other classes, let's say, of human minds, can accept that. I started to think that you cannot make everybody rigorous and thorough and methodical, but later I started to say that I couldn't even let them be impressed with this, because this is dangerous in itself. Dangerous philosophically and intellectually, even dangerous Islamically.

SB: Now, from the point of view of the individual, how do you see science without religion and religion without science? Do you think that a person who has no understanding of science comparable to yours has a sort of lesser faith? Is it a matter of degree?

NG: It's a different faith. It is more of an emotional faith. There are different types of faith. How do you arrive at faith? How do people believe and why do they believe? There are different routes to faith. And there are different routes to non-faith, to unbelief. Some people get shocked at a moment in their lives and they just drop faith. Something shocks them, which they cannot accept.

SB: And you have never had a phase of this kind.

NG: I have never had that. And some people just get a moment, a sort of miracle, something that strikes them – light, 'I have seen the light', as they say in the English-speaking world, and in that moment they just believe. And some others convince themselves, or are more comfortable with this belief. And some others feel it in their hearts; they do not have any arguments. So there are different faiths. Those who do not have an understanding of science and so on or just take faith as an emotional faith, that is fine with me, I understand that. Humans are different. What I cannot accept, then, is for people to start using science in an erroneous manner, to defend the faith.

SB: So, pseudo-science.

NG: Pseudo-science, you know, miraculous design, *i'jaz* (scientific miraculousness of the Qur'an) etc. Now, you can just tell me: 'Listen, I just believe, and I do not understand any of your science'; that is fine with me. In the philosophical tradition one of the arguments for God is the argument from religious experience. People say that they have the experience in their heart. Fine. Another argument is that of design, and I say OK, well maybe it is more convincing to you than to me but that is another matter. But I cannot

accept that people argue in favour of faith from a pseudo-scientific approach. If you are going to take science, if you are going to use science, you better adopt correct science. Or, if you cannot accept all the correct science, including the difficult stuff, like evolution, naturalism, no miracles etc., then just stick to the emotional faith.

SB: And what about science without religion? I mean: a scientist with no faith. Do you think that she has a weaker understanding of what she is doing?

NG: Absolutely not. Science, the methodology, the results etc. should be common to believers and non-believers, so we have a common denominator. Then the believers add to it an interpretation, a theistic interpretation. But they need to recognize it as an interpretation and as an addition, a *post facto* interpretation of the science. They cannot make it a part of the science and then automatically commit the others to it. So there is a clear separation between science, methodology, the results etc. and the interpretation, which can be theistic or atheistic, and that is absolutely fine. So if somebody is a total non-believer and we are doing the same science and publish a paper together, I have no problem, there is no disagreement.

SB: From an ethical point of view, when it comes to the way in which in we implement the fruits of this research, do you think that a scientist without faith is running certain risks?

NG: That is the ethics question. So this is the application now. You always need to have certain ethical principles. Everybody recognizes this. You cannot just take science and go and apply it any way you like, there must be some guidelines, and everybody recognizes that there must be some guidelines. And we see them every day now. The nuclear disaster in Japan,[1] global warming, a million things where people start to say, wait a minute, why are we doing this? The animals, experimentation on them, guinea pigs, stem cell research, there are all kinds of situations where people say, wait, we need to discuss this. So everybody recognizes that there must be some ethical principles before we apply science.

SB: Must they stem from religion?

NG: Not necessarily. Again, here, it is everybody with his own philosophy. Now, we are talking at the individual level, so at my individual level I could have what I might view as a fully ethical set of principles, even though I may be unbelieving. And my next-door colleague may have similar or different ethics that he is taking from his faith or his religion. This is the individual level. Now, when we live as a society, every society organizes itself collectively, so every society needs to find some sources for its ethical guidelines, because then you can have your own individual guidelines, but then the society imposes certain collective rules, and says 'OK this is how we

[1] Reference here was to the Fukushima disaster and tsunami on 11 March 2011.

live, and this is how we are going to do things'. So for example stem cells research could be outlawed in one country, or one society or in one culture, but it could be accepted in another. But an individual scientist could accept it or reject it even though his society says differently. So for ethics there are individual convictions but there are collective agreements that we need to abide by, whenever we live in a given society.

SB: Do you feel any gap between the concept of God you develop as a physicist, when you touch upon cosmological matter, and the God you read about in the Sacred Scriptures? One can find it difficult to build a bridge between the two. Even the most spectacular miracles might seem meaningless if compared to the galaxies. Why should God bother to turn staves into snakes? Or to talk to an individual? How do you cope with that?

NG: Islamic theology, *kalam,* is a whole series of debates and discussions, and there are schools within the Islamic theology field of how to consider God, what is the definition of God, who is God. Who is God, and how do I understand God, and how do Muslims in general define God? You said the God of the Scriptures, and He is not just a mathematical formula; it is not a simple definition. There have been centuries of arguments about who is God, and what attributes should we assign to Him and how do we define Him. Some people have called each other heretic just because you accept this or you don't accept that about God. So, what I mean with this long introduction is that there is again a spectrum of ideas, and views about God. The only thing I think that is a non-negotiable principle in Islam is the unicity of God. Even the transcendence of God is not completely accepted by all Muslims. The transcendence – meaning that He is ontologically completely separated from all the rest of existence or creation; some say that the creation is an emanation of God, and we live in Him, some others, more orthodox and conservative say that God is completely separate and not even imaginable, 'Nothing is like Him', etc. But everybody agrees that God is one. There is no multiplicity, different branches of Him etc. So within or underneath this unicity of God there is a margin of understanding of God, and I think, then, depending on your level of education, on your understanding of philosophy, the philosophical arguments… You use the phrase 'the God of the philosophers' because the philosophers developed a certain sophisticated understanding or argumentation about God. Today, likewise, as you said, there is the God of the cosmologists, or the God of the scientists, at least the believing scientists. Believing scientists have their own understanding of God. And at the other end of the spectrum, in our Muslim tradition there is 'the God or the faith of the elderly woman', signifying somebody who is simplistic and is just a motherly person, and doesn't go for sophisticated arguments.

SB: *La foi du charbonnier* – the coalman's faith?[2]

[2] This expression did not come to my mind because I am a master of French but much more banally because it occurs in Bucaille's works.

NG: Exactly. *La foi du charbonnier;* it's the same. So clearly a scientist or a philosopher, the more he studies these things and the more he gets into these discussions, the more refined his view of God – if he believes in God – is going to be. Now, is that going to clash or be in disagreement with the God of the scriptures? Not necessarily, if you realize that the God of the scriptures is in itself a grey definition, except for the unicity of God.

SB: So still referring to the individual level and to you in particular, do you think that there is still work to be done to reconstruct the two sides?

NG: Yes, and I think that miracles is certainly one of them. It is certainly a major one of them. Or divine action. Does God act in the world, in our world today, and if He acts, how does He act? And if He doesn't act, then what does that say about our relation to God? Prayers. What do we mean that we pray, what do we pray for? Do we pray for God to do something? So do we believe that God can 'delay the train' because I am really running late? So there are certainly issues, there is a lot of work to be done. All these issues are still very complex. I don't even claim that I have worked up a clear and completely satisfying answer to these issues. It is not easy to come to a Muslim or Christian scientist and say, 'So does your God act in the world?' It's not that I do not have any answer, and it's not that I do not want to answer these questions, but they are complex and not really fully worked out.

SB: Your stance towards other religions. Until now we have been speaking of faith, but we have mentioned Islam. Do you think that Islam is compatible with science, as such, because Islam has a privileged status, or is Islam compatible with science because religion in general is compatible? Do you accept that believers of other creeds can attain the same kind of harmony?

NG: First of all, there are different other religions. We have to be careful what we mean by 'other religions'.

SB: Well, I was referring primarily to monotheistic religions, but we can extend the discussion to other ones.

NG: In my part of the world when people say 'other religions' they mean of course monotheistic religions. In the world there are even some religions I have never heard of. There is a significant difference between monotheistic and polytheistic religions because monotheism is about one God and revelation, prophets, and the definition of God and the 'history of God', (our understanding of God) and the history of religion is essentially the same. There is no serious fundamental difference with Islam, if you accept that there are a number of prophets and revelations for Islam and Christianity and Judaism; the same principles that I have outlined, by which we can achieve this harmony between modern science and the religious tradition or traditions, should apply. If people accept these hermeneutical interpretations, and that there are certain basic principles like the unicity of God, then we can work out together the rest, and I am happy to work with my Christian colleagues, and Jewish colleagues, as long as we are working along the same

principles. So they are trying to harmonize their scriptures with science, fine; I am trying to harmonize mine.

Now, do I think that those faiths are equally acceptable or equally valid? On a philosophical basis, yes; from a philosophical point of view, sure. What is the major difference? Religion has two levels; there is my individual belief, convictions, my relation with the scriptures, my relation with God, etc., and then there is the application of religious statements or directives in life, and that varies somewhat from one religion to another, although some thinkers have insisted that it all comes down to the Golden Rule (do unto others as you would like them to do unto you). Muslims of course automatically believe that what they have been shown and the way it has been revealed to them is correct. As long as we keep to those essential principles that I have outlined, that there is only one God, that the whole world was created, that there is a relation or a connection, there is a spirit, the non-physical connection between us and the metaphysical, the divine and the other world. Now, the other religions, we have more fundamental problems with those. Because we disagree on the fundamental principles of the unicity of God, of God being the Creator and the Sustainer of the world, that there is one relationship between every human and God, that there is a spirit which does not die but does not come back and be reincarnated into somebody else, those are fundamental differences.

SB: And this affects also their possibility of finding a way to harmonize these beliefs with science.

NG: They will have to look into how. I just really don't see how you could have a multiplicity of Gods, like in Hinduism; thousands of Gods, and then you have cosmology, modern cosmology. I just don't see how you can connect that. What is it? Some of the Gods clashed one day and then there was a Big Bang and then some other Gods clashed and there was a galaxy or something? I mean, it's very hard for me to conceptualize any harmony between this kind of belief and science. But then of course there will be some Hindu scientist who says I know how to do it and I will say 'OK, good for you!'

SB: So you accept that a contribution to the debate on science and religion can be given also by Jews and Christians. There is no privileged position of Islam.

NG: On the philosophical dimension, yes.

SB: Your position regarding the 'older generation' of thinkers who took up Islam and science, Nasr, al-Faruqi and Sardar is quite clear. To put it in a nutshell, you criticize them because you think that science is autonomous and it is in no need of a reformation or 'infusion' with new concepts. Now I would like to ask you about your colleagues, who also write from a background in the natural sciences, those I am inclined to call a 'new generation'. I would like you to elaborate on differences and commonalities.

NG: So, let me see. There are three others whom I quote in my book and who you put into this 'new generation'; one is Bruno Guiderdoni, the other is Mehdi Golshani, and the third is Basil Altaie.

SB: Yes, of course you are free to extend this list, to exclude somebody… It is up to you. The 'new generation' is quite widely conceived. It would be fine with me if you criticize it.

NG: In fact I think it is a very good idea to think of this group as a new generation. I think you really hit on an interesting new development and you are trying to present this new development as something not only important with broader implications than for just the science and religion field. This has repercussions for the understanding of Islam itself, its position with regard to modernity, its variety of interpretations, in Muslim communities of the West and Muslim communities of the traditional Islamic lands. It is very useful to show that there is indeed a new generation tackling this, compared with what was happening in the 1970s and in the 1980s, because of these cultural implications. I strongly support this new conception of this 'new generation'. The difficulty with this now is in being more or less inclusive in the new generation – which are the really new voices?

I tell you what my difficulty with this is. I agree in including the three names that you have mentioned, but they have made very diverse contributions. Mehdi Golshani has been around for about 30 years. He has half a dozen books; he has a clearly defined approach, which I can explain very briefly. Bruno Guiderdoni is my personal friend and he is barely mentioned a couple of times in my book, because if you look into the literature, even though Bruno is quite present in the Islam and science discourse, he doesn't have a book yet, he doesn't have many articles even, whereas Golshani has books, he has been lecturing widely… So it is very difficult to reference Guiderdoni when we talk about his approach. I think I understand it because I had many discussions with him, although he tends to be elusive a little bit, he tends to be a bit soft; you know, he would not come out and present his views very clearly and be criticized, as I am criticized, for example by the Nasrian group. As to Altaie, he is even more difficult, because he has a few articles in Arabic, and he has a few articles in English, some of them better written, or rather more formally written than others. I heard him, I talked to him, he gave seminars on cosmology at my university, so I have some irregular interaction with him; but he should produce a body of work.

What is the definition of the new generation? I would say people who are seriously interested in Islam and science in the past ten years or so should qualify. Anybody who has appeared on the scene, who has written something of substance, who has been participating in the discussions, has spoken at conferences since 2000, should qualify as new generation. The age really is not a problem since, as you can see, we have Golshani who is 72, whereas some others are much younger…

SB: So, if I interpret you correctly, there is a fundamental challenge posed here to the new generation, that of visibility. They are there, but they should be more systematic and more active.

NG: More visible and a little bit more formal.

SB: If you think about *i'jaz*, like people like Professor El-Naggar, or if you consider the popular perception of Dawkins, you indeed have to cope with widespread and very vocal competing views.

NG: Yes, this is why I say that it has to be visible and it has to be formal. There are many people who are very visible. I might turn on the TV right now and hear people who talk about science and *'ilm*, but they have never written anything of substance that I should worry about.

SB: So, perhaps the other ones that we have listed have not been so systematic, but you also have the privilege of knowing them personally, so let's try to deal with the differences. Do you see any points of divergence, or can you say that they are all part of the same enterprise, just taking up different sectors of the same field?

NG: No, I think there are philosophical differences of substance. They are not opposite necessarily; they are not like Sardar and Nasr, or Sardar and al-Faruqi, or Sardar and Bucaille. We do not have this kind of opposite viewpoints, but we do have some philosophical differences. For example, Bruno Guiderdoni is much more Sufi/holistic in his approach... According to him, the world is one, knowledge is one, and the whole world is a part of God, and so there is this divine field that we all exist in, and that divine field affects us as humans, affects nature, affects our understanding of nature, and of course we have a mind, but this mind is also related to God, so there is some rationality. So Guiderdoni is not anti-rational by any means, he does not attack rationality as for example Nasr would do. He does not attack modern science; on the contrary, he takes everything from modern science very seriously and upholds it, there is no discussion about the methods or results of modern science (whereas Nasr would reject, for example evolution). Guiderdoni has this full understanding and respect for modern science, but he sees reason as only one aspect or one element of our interaction with the world.

SB: So you do not agree with Guiderdoni when he leaves a door open to mysticism?

NG: There is this mystical dimension that he thinks is very important, and needs to be taken into account when he understands the universe, the world, humanity, revelation, religion.

SB: Is this something that you oppose, or you are just not sympathetic to it? Mysticism is not really a theoretical position, so it is also difficult to develop a theoretical, rational argument against it, in a sense.

NG: No, I do not object to it, I guess my distinction, my separation from it is that I do not do this kind of integration. I do believe that humans have this double dimension, spiritual and physical. I believe that there is and there can be a spiritual connection with God, and that can affect my mind and the way I think, the way I behave or my morals and so on, but I really believe that the

world is governed by physical laws, and the mind is best equipped to address those physical laws and those mechanisms. Now, the mystics say, 'Yes, but the mystic can receive some kind of illumination from God, be given certain truths etc.', people get a sort of 'bright light', a sort of 'click' which we don't really know where it comes from. You get an intuition one day, you can say that it is from God or that it just clicked in your mind because you became obsessed with it after thinking so long about it, so I do not dispute that there can be certain mental states or mental revelations. I do not mind that, but I do not make it part of the process of discovering the world. That's a substantial difference and the only difference between Guiderdoni and me; we agree on all the rest. We agree that religion should not be taken literally, we are both non- and anti-fundamentalists, we are all for the plurality of interpretations of the scriptures, there are so many things that we agree on.

I have even fewer differences with Golshani, surprisingly enough. Golshani, like others, upholds what he calls 'theistic science'. I think in the way Golshani defines it I have absolutely no problem with it. It is what I call in my book 'a theistic layer of interpretation on the top of real science'. As long as this theism does not enter into the scientific process, then I am all for it. As far as I could read, I think that is how Golshani sees it, so I have no disagreement with him. In terms of religiosity, Golshani is somebody very interesting because he is Shiite but at the same time he is the most tolerant of the Shiite tradition; I do not mean that this tradition is not tolerant, the Sunnis, orthodox Sunnis and Wahhabi Sunnis can be much worse, but he is a Shiite who is very close to the Sunni intellectuals. I do not really see serious issues with Golshani. He tends to refer to the past and if a typical Sunni reads his books he might get a bit annoyed with the multiplicity of Shiite references he quotes: Ali, Ibn Talib; his main references are Mutahhari, and some of the great scholars of Shiism, which is fine with me. You can see the Shiite side of Golshani, and that's normal. If I am reading a catholic thinker I shouldn't be surprised in seeing references to St Thomas for example. If I am reading a protestant thinker I can see references to Luther or Calvin… It is normal. But as to the differences between him and me, you wouldn't see too much of Shiite tradition in my work, although I was very happy to side with and uphold Golshani myself, and others in my book. But the emphasis and the mental, intellectual reference are slightly different.

I really appreciate Altaie's approach as well. I am very happy that somebody is focusing on *kalam* doing it with a scientific mind-set or a scientific dimension, so to speak. How can science help me reconstruct or re-ignite *kalam*? This is very useful. I have had discussions with Altaie, who has told me that he considers himself Mutazili and he has some sort of Mutazili group around himself, or next to him in Jordan, and I thought that this is great, because these are great traditions of the Islamic civilization that need to be revived. I am glad that people are not afraid of revisiting and re-declaring the glorious tradition of rationalist *kalam*. What I would like to see is a systematization of Altaie's ideas, especially pertaining to Ghazali, whom he strongly upholds, perhaps too strongly, and some of the *i'jaz* ideas, which he seems to accept, as far as I can judge by what I have read.

SB: When it comes to scholars who oppose the whole discourse on the harmony of Islam and science, I am aware of at least of two systematic, extensive and visible attempts. One is P. Hoodbhoy, the other is T. Edis. They criticize figures and ideas that rather belong to the older generation. You are certainly aware of the criticisms they level at them, do you think that it affects your views somehow?

NG: Well, they haven't presented their criticism with respect to my views. Perhaps they would not even accept them; perhaps they would be indifferent to them. They have some commonalities and some differences. Hoodbhoy is a standard secularist. He is into separation. He doesn't attack religion in principle; he attacks religion when it becomes violent, fundamentalist. He lives in Pakistan, so he has plenty of opportunities to experience extremism and attacks, even on campuses. So I can understand his viewpoint. I am not sure whether somebody like me, who is not fundamentalist by any means, who respects and upholds modern science completely would be objectionable to him. He might say 'Yes, sure, I do not believe what he believes, I do not think we need to establish any bridge between the two bodies, let them be completely separated from now on', which I think is even tactically or strategically infeasible with the Islamic culture. I follow his articles regularly; any time he has a piece on a major topic I read it with interest.

As to Taner Edis, I have met him at least once and I had a nice conversation with him. Edis is an atheist, and he says so explicitly. He rejects religion and spirituality. Any attempts at finding a theistic science or theistic evolution is just giving in to religion; in his opinion, we shouldn't even allow any sort of compromise or agreement – accommodation (the word used in the States nowadays is accommodationism). We should not even accommodate religion; science and religion should each stand alone and be completely separated from everything else.

Now, the commonality between the two is that, first of all, they take the *i'jaz 'ilmiy* and the anti-scientific discourse and they attack it very easily. And I attack it too! I totally agree. But they also reduce Islam and science to that. If that is Islam and science for you obviously there is no option but to attack and demolish that. But for me that is not Islam and science. That is one visible, large part of the discourse in recent times, and it needs to be attacked, erased, pushed aside, because it is counterproductive, just destroying even our Islamic cultural mind-set. But that is not the only option.

SB: A very important concept for this debate, for you, for the old generation, but also for the opponents, is the so-called Golden Age, a period taken as historical proof that there is harmony between Islam and science. I am sure that you are aware of Hoodbhoy's criticism, who points out that the times and territory it proposes to cover make the label too vague, it turns out to be a slogan. Science, in his reading, was anyhow too different from what is meant today with the term, so they are incommensurable. What is your answer to this?

NG: For the most part I agree with that. Obviously science in those times was radically different from today's science. That is why when I talk about science I always specify 'modern science'. Modern science is significantly

fundamentally different from Islamic science, classical Greek science and medieval science. In that sense, Hoodbhoy is right. But we are not referring to the glorious Golden Age in order to say 'You see? It was perfect then, so it can be perfect now'. No. Otherwise I wouldn't need a book, I would state it in one sentence.

But I think there is another criticism that is more powerful. Hoodbhoy says: 'If you look at the Golden Age, you will find that those who were really "golden"'...

SB: ...were heretics!

NG: Exactly! He has a chapter on that, where he even includes my guiding spirit, Averroes.[3] Why are they heretics, according to Hoodbhoy? Because they were not orthodox, they were not fundamentalist. They were not like Al-Ghazali, who believes that if you deviate from the orthodox description of the understanding of Islam, you are no more a part of Islam. My view is completely different from that. I would be happy to discuss this with Hoodbhoy. Islam was never monolithic. This is the fallacy. Islam has always had a multiplicity of schools and even sects. We have a huge spectrum of Islams. Now, if anybody says that everybody is wrong, then we end up all being wrong. If we allow somebody to say that others are heretics, then we are all heretics. Indeed I go even further than that when I say that you will find, among these 'heretics' that Hoodbhoy mentions, people who have tried at least in their minds to harmonize Islam with philosophy, rationality, science and so on. Ibn-Rushd is one of them, Al-Biruni was another, and some others to a lesser degree, who were fully faithful to their religious beliefs and traditions, who were practising Muslims but at the same time they were fully rational, and in their minds they could find some kind of harmonization. Ibn-Rushd spelled it out in one of his books; others did not write it down, but you can see in their biographies that they did not see a clash between science and religion even though they upheld equally their religiosity and their philosophy of science. So it is not true that in the Golden Age people were either completely separationalists or completely confused.

SB: But you agree that the Golden Age as a label runs the risk of becoming a blind slogan if we do not inspect it closer and focus on single figures? Can we say that one of the challenges for the new generation is to make this definition more precise and use 'Golden Age' as a working title?

NG: Absolutely, 100 per cent. There is a huge amount of work waiting for us, to re-present, perhaps not rewrite but at least re-present our history in a more accurate manner, in a sharper view than 'we had seven centuries of greatness, then something happened to us'. There is a lot of incorrect understanding and representation of Islamic history, including the Islamic science period.

SB: In your book you hint at the status of scientific education and scientific culture among the general public in Muslim countries. You are mostly

[3] Hoodbhoy 1991, 114–115.

critical of it – for instance you say that it is too unbalanced in favour of purely mnemonic learning.[4] Can you expand on this, and differentiate between different Muslim countries, since you had the opportunity of working in several of them? Can you say what the most urgent measures are in order to improve the situation?

NG: You are right, there are variations in geography but there are variations in recent years, things are very fluid and evolving all the time. There are reforms, there are new curricula, and I have been involved in projects of the Ministry of Education at least in two or three Arab countries in the past ten to 15 years. All this is evolving. It is like this Golden Age idea that we have just discussed, we cannot talk about the 'whole Arab world science-education issue'. We must be more specific. I gave examples in the book of the typical situations I encounter around me, but there is a difference between the typical situation and efforts that are being made here or there. Now, there are general measures, if we want to zoom in. There are international tests of science and mathematics done every two to three years, examining or testing pupils, children in elementary school, high school, etc., standardized tests all over the world. We find that the Arab Muslim world is always in the bottom half. There isn't a single Arab or Muslim country that has taken part in these international standardized tests of science and mathematics that has scored above average, so we can see that there is a general problem. Now, within this general problem some of the countries are really at the very bottom and some are a little bit below the average. There are varieties. There are other indicators. For example, how many people go into science fields at university level; how many PhDs we produce; how much intrinsic research is being done; how many science magazines are there; how many science documentaries or science TV shows are produced by Arabs (not just bought and translated); how many general science books; how much science fiction is produced within the Arab world…

SB: I find this remark about science fiction interesting. Do you think that it plays a role in awaking interest in real science?

NG: I think it is definitely part of the science culture. Now, people might disagree and say 'We are not having fiction of any kind in the Arab world. People do not buy books, forget buying fiction, and forget even more about science fiction'. I am describing the situation. If you look at how many science journalists… Until less than ten years ago we almost didn't have any science journalists in nearly the entire Arab world. Now at least in the last years there is a new association of Arab science journalists. As I said, things are evolving, but it is still small and very slow.

SB: Which country is doing better? And which one is worse? And, on a world scale, which country would you take as a model?

NG: In science education, I think that the international tests place Tunisia and Jordan as the better achievers. They place some of the poorer countries

[4] Guessoum 2011, 7–9.

obviously, but also some of the richest countries, for example Qatar, extremely low on the scale. In terms of effort – you know, when you go to school you get a report that grades both the achievements and the effort – well, in terms of effort some of these countries, Qatar for instance, get a 'D' for achievements but definitely an 'A' or a 'B' for effort. Some other countries, for example Algeria, my own country, I would say that deserves a 'D' for effort and a 'D' or a 'C' for achievements. There are efforts being made especially in the richer countries. The countries that have the means and realize that they are behind are working very hard. For about five years I worked with the Ministry of Education in the UAE as a consultant for science education, and all of the books have been replaced, there have been series of workshops for the teachers, to re-train them, technology has been introduced in many of the classes, experimental methods... How much of an impact this is making, I think it has yet to be seen. Some progress has been made. In terms of scientific culture, I am not really aware of any particular pan-Arab science magazines out there, maybe one or two in Egypt, Lebanon and elsewhere. They appear and disappear and they are not very regular, but a science magazine that is known to all the Arabs and is bought on a regular basis does not exist. There are science TV shows. Two years ago there was in Qatar some kind of show like *America's Got Talent*, those shows where people come in and show their talents and then get votes, but this one was just based on science; *Arabs Have Science* it was called, or something like that. It showed people from the Arab world and showed the scientific talent.

SB: Was it about exhibiting the possession of notions? Showing that you know plenty of things? How was science portrayed?

NG: That is a good question. I did not follow it; it was a weekly programme. But I watched documentaries on it and it was more about technological innovation rather than science. Something like 'I can invent a little device that can measure your heartbeat and other body parameters while you are running' or 'I can invent an electronic filter for the bathroom'... It was about inventions. They require a little bit of knowledge of course, you cannot just invent stuff with your hands, you have to know what science is behind it, so there was some science behind it but it was more technology. But at least there was this TV show, made by Arabs about Arabs, which had to do with science and technology. This was really new. We hadn't seen anything like this until about three years ago. Very few shows, if any, deal with science per se. Also, science books are very few, some of them are translated and sell a little bit... Like books by Stephen Hawking for example. *The Cosmos* series by Carl Sagan[5] was shown on TV; but intrinsic to the Arab world, cultural production relating to science is extremely rare.

SB: Which country or politics would you take as a model, and in which measures?

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[5] Carl Sagan (1934–1996), U.S.-American astronomer, astrophysicist, cosmologist, and author. The series *Cosmos*, written by Sagan himself together with A. Druyan and S. Soter, and presented by Sagan, was originally aired by PBS between September and December 1980.

NG: I have seen reports lately about Finland having some absolutely revolutionary educational approach in general, including science, not specifically about science education but education in general. The countries I usually refer to as 'the usual suspects' are the Far East, Singapore, Taiwan and Scandinavia, such as Norway and Finland – the ones that always tend to do very well in these international science and mathematics standard tests. These people seem to be very satisfied and happy with the way in which education is conducted, so they must be really doing something right; it is not military education. They achieve and at the same time people are happy with the way things are done.

I am trying to understand what they are doing right and in my understanding they really took the teachers and re-modelled the way they function. A few things: Number one, in science education we have had for a long time this principle that you cannot let graduates of science teach, you have to take graduates of education and specialize them in science. Apparently Finland has falsified this principle. They have insisted that if you want good teachers of science you have to train them in science. Number two, they have insisted on teamwork or group work between the teachers. The teachers must always discuss among themselves what they are doing in the class and what is working and what is not working. Number three, they have largely decreased the emphasis on examinations. We do not need to have a sort of 'national examination', a sort of baccalaureate, if we want to check that our students are really doing the job. We can allow the teachers to examine students in their own way and decide who can pass to the next level. Number four: students do not need to be at a given level with respect to their age. They do not need to be at grade seven just because their age is 13. In fact, in the same classroom you can have children of the same age at different levels. There are several differences in educational approaches and policies that we really need to look at very carefully.

SB: You are very concerned with scientific education and culture, with the rough material so to speak, but you are also a theoretician of science, and you remind us that science should not be practised blindly. We should be aware of it as a process, and in this case it is the philosophy of science, the discourse on method that is very relevant. We might define the role of philosophy in your thought as a sort of guardian of science. What about now philosophical education and culture in the Muslim world? You have this 'hidden treasure', the Golden Age, but are students in high school and in university outside of the humanities really aware of it or is it only a matter shared by a few academics?

NG: Yes, that is an issue. Philosophy more generally is not nearly appreciated enough, as it should be. It is not publicized and practised enough, even in academia. Although there are also large differences between Arab and Muslim countries. Philosophy is almost entirely absent from the curricula in Saudi Arabia for example; it is very strong in the Maghreb region, Morocco, Algeria and Tunisia. My own father is a philosopher; he chaired the philosophy department at the University of Algiers for many years. Even today there are

some strong philosophical traditions at least in academia in some parts of the Arab world, and there are some very weak traditions.

Now, how much is the philosophical tradition of the Islamic culture and civilization appreciated and upheld? Very weakly, I would say: People are always happy to mention names and praise them – Ibn Rushd, for instance. Then you ask if they can mention two or three of his books and they are in bewilderment. Or Ibn-Sina. Ask 100 Muslims today from throughout the Muslim world if they have heard of him. They will say yes and then define him as a physician, the greatest doctor in the history of Islam! People are not even aware that Ibn Sina was first and foremost a philosopher and that his greatest works were philosophical works. One person once wrote a book and described Ibn Sina as a physician, giving as an example the title of his book is *Kitab al-Shifa', The Book of Healing*, which in fact is seen as spiritual healing. That person did not even go beyond the title of the book! He wrote that the book was one of the most important ones that Ibn Sina wrote on medicine! There is this tradition of upholding big names while minimizing their philosophical contributions. Or go to the Arab world, including perhaps Saudi Arabia, and mention Ibn Rushd (do not even say Averroes, or they will not recognize him), and they will define him as a great jurist, a physician and a lawyer, somebody who wrote some books on Islamic jurisprudence... But his philosophical tradition and his philosophical works are largely unknown. So, there is a big weakness, although it varies from country to country. I think there is a growth of interest, a bit of re-examination, people are a little bit more critical now, they are reading more – I mean the intellectuals, the educated class. They are reading about the Islamic heritage and often reading about it in Western books. I always find it very illuminating to read about my tradition as seen by Western eyes. I have learnt a tremendous amount; my eyes have been opened. Of course I had to go back to the sources, check, read and so on... I have the luck of being able to read in Arabic, English and French, but a lot of illumination has come from the books I have read by Westerners.

SB: So you advocate a reform of philosophical teaching?

NG: Yes, definitely. There are still many topics that are not open to discourse in most of the Arab world, including belief itself, including the status of reason, the status of revelation, the status of the scripture. Philosophy has a huge spectrum of topics and issues that it can investigate, but in the Arab-Muslim world it is still a bit constrained.

SB: At which age would you introduce philosophical teaching, and in which form?

NG: That is a very good question and a very difficult one for me to answer. I was introduced to philosophy in my last year of high school, formally through the school system. I think it is still the same in Algeria. There is a formal course of philosophy in the last year of high school. I thought it was very beneficial, although I realized later that I was not quite ready yet to digest all of it. I took some topics, I learnt some names, we had Descartes, Spinoza, Ibn

Rushd… But I think I was too young at that age, or I wasn't prepared enough, or maybe I was more into the sciences at that time. I think it was only two hours a week of philosophy compared to eight hours a week of mathematics and six hours of physics. So I am not sure. On the one hand, if you introduce it in high school, you are touching a large fraction of the public, on the other hand, if you wait until the people become more mature you gain a little more on the quality but you miss out on the quantity, so I am really not sure.

SB: What about the clashes between scientific and religious institutions? Your situation and experience is different, for example, from that of someone who works in a country with a powerful religious hierarchy. Can you tell me how you perceive this problem, if you perceive it at all, and on which specific points? Moreover, you advocate some views that are rather against the tide, for instance, evolution. Have you ever been attacked by a religious institution and if so, how did you respond?

NG: Let me begin with the last question. I have never been attacked because I am not that famous yet, at least in the Arab world. In the Arab world I am more known for my astronomical research and my contribution to the Islamic calendar issue.[6] So people are not quite aware of my views on evolution and other such controversial topics. I did have a public, TV encounter for a full hour with El-Naggar on Darwin, and we clashed very strongly, but it didn't have repercussions, it didn't reverberate in the media. It hasn't snowballed yet. But I do have quite a bit of experience on the Islamic calendar with the religious institutions. It is not a fundamental clash, and it is not one of dangerous clashes in which people can be branded as heretics or *fatwas* are issued, but for example a few weeks ago, at the end of Ramadan, we astronomers were on an Al-Jazeera live show for two-and-a-half hours, we were clearly stating that that night there was no crescent to be seen. One hour later, as we were still in the studio and speaking live, the Saudis declared that two or three people had seen the crescent! In my own country, Algeria, the government accepted the testimony of people who claimed to have seen the crescent, which we know astronomically that it was below the horizon – it wasn't even in the sky! So it wasn't even too thin or too faint, it wasn't in the sky! So they threw away our science and our statements in the press, that we had started making two or three weeks in advance. So there have been several articles and counter-articles in the press between the traditional religious scholars and the astronomers, who say 'enough with this nonsense, it is for us to say when the crescent can be seen and cannot be seen!' They just do not allow us to intervene on religious issues. But we are not interfering with religious issues; we are make astronomical claims.

SB: This seems to me a very interesting point. It sounds like the Muslim version of the Galileo case, five centuries later, even if it is a common

[6] See Cartlidge 2011.

statement that nothing like the Galileo case can emerge in the Muslim world![7]

NG: You are right; it is not so fundamental as in the case of Galileo, where there was reference to the scriptures, whereas the astronomer was advocating a non-literal reading of it.

SB: Actually, several scholars point out he wasn't even original in his claims; he could even refer to Christian authorities on that matter. In the very end, it was more a matter of questioning religious authority, whatever the matter.[8]

NG: You are absolutely right, because in this case, which has been known for years, it is a question of authority indeed, and we are saying that in science the religious authorities have no say, they cannot come in and say that they will accept a testimony because that is just tantamount to saying that all of our astronomy knowledge is irrelevant and not acceptable. There is behind it, of course, like in the case of Galileo, a clash with literalistic standpoints in religion. But in this case it is not the Qur'an that is at stake. It is the *hadith*. There are some very famous *hadiths* that everybody knows, which say that the month will start and will end when the crescent is observed by some of you. When you see the crescent you start the fasting, and when you see the next new crescent Ramadan ends. What we say, in a nutshell, is that the statement by the Prophet was meant to imply that this is when the month begins, it doesn't mean literally that someone has just seen the crescent, or claims to. Otherwise, somebody might be in some place in the world where you would never see the crescent. Or you might be on a space station, or on a plane, and never see the crescent, what would you do? So we tell them that the idea is to determine the beginning of the month, not to visually observe the crescent. So, again, it is a question of interpreting the *hadith* in a literal manner or trying to understand the objective behind it.

SB: In which country do you see this clash, and in which others do you think that religious authorities are more willing to listen to what astronomers say? Where this does not happen, and what do you think is a suitable solution?

NG: The traditional orthodox Muslim countries – Saudi Arabia, Pakistan, a lot of the Middle East – is still in that situation where religious authorities rule. Even if, when you talk individually to people, even the authorities like the minister of religious affairs, they will say that they believe you, but then in the end they listen to what the *imam* or the *shaikh* has ruled and it is what they are going to announce. There are other countries, like Turkey, with its secular tradition, which are more rational in this regard. Or in Malaysia, for example, they have found some very reasonable compromise. Libya used to be much more astronomical, rational and then this year they have reverted to the

[7] This point had already been touched upon, for instance, with Professor Altaie; however, I was here thinking of a statement by Abdus Salam (cf. Salam 1987, 180).

[8] For a recent refutation of some related myths linked to the figure of Galileo, see Finocchiaro 2009.

traditional approach. I think that the solution is education, explaining to people and letting them understand. They should understand that we are not trying to destroy religion, to remove it from the public life, we are just trying to make it a little bit more suited to the requirements of modernity and the knowledge that we have today.

SB: One might also say that the religious position in this case does not directly affect the astronomers' practice. Everybody sticks to his position, it is a sort of arm wrestling, but in the end things are pretty much the same. But what about when it comes to issues like medical ethics?

NG: You are right; it is a matter of authority and as an astronomer nobody comes to me and says 'Don't do these calculations because they are not allowed!' Yes, in medical fields, surprisingly it hasn't been such a big issue, because in those areas we have found much more room for manoeuvre. As long as the physicians and the biologists are working under principles like the greater good and for the benefit of humanity. There are only some red lines, like euthanasia. Even abortion – people consider that, since according to some texts the soul or spirit is infused only on the fortieth day in the embryo, then if there is a serious problem before that day the embryo can be discarded, not having a human spirit.[9] There are many areas like this where people have not seen serious problems. As to cloning, it has been differentiated according to the extension of the experimentation. If it is only a matter of cloning some cells needed for medical therapy, that can be done. There are few instances that are posing some limitations but by and large the medical field has not suffered very much. As to stem cells in particular, on cloning and bioethics and bioengineering we should also observe that this issue hasn't come to the fore as much. But in the places where it has come up, the scholars have been much more lenient and much more accommodating.

SB: Can you mention any case of a Muslim country in which religious authority in a very concrete way has been interfering with scientific advancement or research?

NG: Not research in itself. The issues with science and religion do not tend to be on the level of research, they tend to be on the philosophical, conceptual level. It has to do more with the way in which science affects your understanding of religion, morality and society. Only in those cases that I have defined as 'red lines' have people found difficulties, and even then they have found some ways. It is more in the general mind-set; it is not in the practice of the research. As I often repeat, one of the main antidotes is the teaching of the philosophy of science, which is almost never done. We need the Muslim scientists to be *scientists*, not Muslim technicians. We have thousands of people who are very capable and skilled, and can do very advanced research or work, but their understanding of the nature of science and how it fits with general knowledge is fuzzy at best. That is the area where we need more work.

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[9] For an analysis of this debate see Eich 2008.

SB: Let us go back to some conceptual disputes. You strongly oppose *i'jaz*, you think that it is absolutely wrong to see it as a miraculous trait of the Qur'an's supposed 'scientific content'. So one is on the wrong path if he or she is trying to find scientific notions in the Qur'an. According to you, the real virtue of the sacred text is that it is found to be always open to new interpretations, to a multi-layered interpretation. The first question is whether you accept that these interpretations sometimes contradict each other, and secondly do you accept that some parts of the Qur'an can be obscure – perhaps not forever, but so far?

NG: Let's start with the second question. Definitely. I do not think that at any moment in time we are given full understanding of everything that was stated in Qur'an – or in any other book, holy or not! Nobody can claim that every idea of any book can be fully and definitively understood. As to the first question: yes of course, interpretations are human, to begin with. And if all the interpretations go in the same direction then I get very suspicious. It would mean that the interpreters are just repeating or trying not to conflict with each other. On the contrary, I want contradictory interpretations! Because, that is when we start asking questions. Then some of them are going to be correct, some are going to be half-correct, and some are going to be wrong. So I do welcome a variety of interpretations, and that it is discussed.

SB: Back to the problem of obscurity. Some quote for example the suras that open with hardly interpretable letters, or sounds…

NG: I agree with this example. Nobody has a definite understanding of what they are supposed to refer to. But I think that there are also other statements, which people have tried to understand and still one has the feeling that the attempt at extracting the meaning is a little artificial.

SB: So do you tend to relate this obscurity to you, or do you think that there is obscurity related to a certain epoch in time: 'Right now, we, humanity, including the most skilled interpreters, cannot understand this passage'?

NG: Yes, I do believe that humanity is not able to understand everything, at least not in a satisfactory manner. I believe that there can be several layers of interpretation. Some people may have an interpretation for a passage or another, but can we really take it and say that it is the definitive one and move on? No.

SB: You are known for your rejection of miracles. Why your uneasiness with miracles? Other scientists have found a way of rationalizing the belief in miracles by resorting to tools that come from their physical knowledge. Golshani, for example, reminds us that we do not know all the laws of nature. Altaie, who is used to thinking in terms of quantum physics, assigns non-zero probability to a staff turning into a snake. Finally, you share this uneasiness with miracles with an author who seems very distant from you, Sardar, who also rejects miracles.[10] I am referring to Qur'anic miracles, but

[10] See for instance Sardar 2011, 7.

you can extend your discussion to other miracles, Sufi ones for example, and even zoom in on specific miracles of the Qur'an and treat them piecemeal.

NG: Let's address my colleagues' positions first. I do not want to necessarily disagree with them. Golshani says that we do not know all the laws, so maybe there is a law at work that must still be discovered. First of all, what do we mean by 'miracle'? If we mean a violation of a law, it means that we already know that law and something has happened and it has gone against this law. So either the law is wrong or something supernatural has superseded this law. So it's not like we do not know: if we do not know the law, we do not know what's happening; it's not a miracle! When people investigated phenomena they did not know, like magnetism or quantum physics, they did not go around crying 'A miracle! A miracle in my laboratory!' They just said that something was happening that they did not understand. It is one thing to not understand something and look for the law, the formula or the effect that explains it; it is another thing to claim that there is a miracle. In that sense Golshani is not discussing miracles at all, he is discussing what we do not understand and what we can explain and what we cannot explain. I do not see the relevance of that.

SB: Can't we apply this to scriptural miracles at least? Take, for example, the parting of the Red Sea. We can say that it is perfectly understandable in physical terms nowadays, and that actually it was a miracle more in the sense of the right event at the right time, to help the Hebrews. In this sense, what was a miracle for them at that time is not a miracle (in the supernatural sense) for us, since we have full possession of the laws of physics that explain that.

NG: I fully agree with that. And that is why I asked a minute ago 'What do we mean by miracle?' But Golshani is finding space for miracles, not able to explain scriptural miracles on the grounds of laws, which weren't known then whereas we now know how the natural world works. There is a difference between being able to explain something and finding space for miracles by saying 'We do not know everything'. It is precisely because we do not know everything about the world that we cannot claim miracles! Until you know the law and you can show me that there is a violation of it, we cannot resort to the category of miracle. Otherwise there is no discussion of miracles to begin with.

Now, let's move to the quantum effects. First of all, the quantum effects work at the microscopic level. Once you put too many particles together, even if there is some quantum uncertainty, or quantum randomness at the individual atomic or molecular level, if you put them together at the macroscopic level this cancels the quantum effects. We cannot translate quantum effects into the macroscopic levels; I cannot have all of a sudden a staff turning into a snake. Quantum mechanics does not allow you to do this. If you look at electrons seemingly going through two slits at the same time, not even that is a 'miracle'; it is how things are supposed to go according to quantum mechanics. It is a 'miracle' if we compare that to our macroscopic experience of the world. This is what somebody has defined as a confusion of scales. It does not work.

There are a number of classical thinkers of Islam, including some exegetes, who have said that none of the stories that relate to Muhammad himself have any physical miraculous relevance. Many statements by Muhammad say 'My only miracle is the Qur'an'. He, an illiterate person, who had never gone to any school, could come up with this huge programme of how society should function and how humanity should relate to God. And it worked. And the book is still fascinating and moves a billion people today! That is the miracle that he was claiming. So there are traditions within Islam, within orthodox Islam, that say that the only miracle that Muhammad himself claimed is the Qur'an. A 'miracle' in a more general sense.

SB: So would you subscribe to this usage of the word 'miracle' restricted to this concept? The *classical* concept of *i'jaz*, so to speak? 'Miracle' as the event itself of revelation and its formal beauty, which cannot be imitated, not even if all humans and *jinns* would gather and try...[11]

NG: Yes, 'miracle' in the more general meaning. Something extraordinary. As if somebody would sit down and paint an extraordinary painting; then I would say 'He has just performed a miracle in front of me'. But there is nothing miraculous physically.

SB: So, extraordinary and unique.

NG: Exactly. Extraordinary and unique, beyond what we consider as human ability.

SB: Would the term apply also to the capacity of the text to have many interpretations?

NG: Yes, absolutely. That would be one feature of it, that it can accommodate all kinds of ideas, all kinds of periods and all kinds of intellectual levels etcetera. So in that sense I do not mind people speaking of the Qur'an as a miracle, in fact I welcome it. But let's not mix that kind of miraculous nature of the Qur'an or of the revelation itself with the physical miracles. I am saying that even in the Islamic tradition there is a large tradition of not calling upon miracles for the Prophet himself. Now, if the last and greatest Prophet did not perform miracles, why do you think that there must have been physical miracles in the past? Maybe people saw something or were convinced, maybe the supposed miracles did not even occur like this, maybe the stories that are related in the Qur'an are not to be taken literally, maybe they didn't happen historically exactly like this, it is just some story told to convey a moral, to convey an idea about God and humanity, and injustice... Probably we are not talking about physical miracles at all, they are just parables about the fact that God can intervene, can help and so on.

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[11] I am here echoing Q 17:88: 'Say: "If the whole of mankind and Jinns were to gather together to produce the like of this Qur'an they could not produce the like thereof, even if they backed up each other with help and support".'

SB: But this affects very delicate points, for example, the parting of the Red Sea. It is very hard to see it only as a metaphor. Because that must be a real event that was part of the concrete liberation of the Hebrews, wasn't it? I know it is not so central in the Muslim narrative, but still, it is part of it.

NG: I do not mean that everything is a metaphor. Then somebody might say that if you turn everything into a metaphor then you might take the Qur'an itself as a metaphor and leave it at that. I am saying that we should be aware that not all the stories are to be taken literally. Some stories are clearly meant to be subjective. God wants to convey an idea and teach us a moral. Yes, in some cases maybe something happened. Maybe there was a meteorological event and people refer to this situation as a miracle. Even a coincidence can be defined like that. The Hebrews arrived at the Red Sea and at that moment there was a big storm. Now, if God intervened or pushed the Israelites at that moment – because God influences people through their spirit – maybe they were encouraged to move on a particular day because that particular day would have the most appropriate conditions for escape. So people refer to a lucky event as a miracle. Not necessarily a violation of laws.

SB: So you do not believe in the violation of laws, not even in the light of the Qur'anic verse stating that it is enough for God to say of something, let it be, *kun*, and it is?[12] The omnipotence of God?

NG: The meaning of that verse is that God is omnipotent. But because He is omnipotent it does not mean that He is just going to violate His own laws. So I am not saying that God *cannot*; I am saying that God put together the laws so that things function in an orderly manner. Otherwise, what is the point of putting together laws, and then doing whatever one wants every now and then? The world is ordered and harmonious; the Qur'an itself emphasizes that. On the contrary, God is saying 'I am omnipotent, but even I, omnipotent, put together laws by which my creation proceeds, and I want you to follow laws, and I want you to be orderly, to follow the order'.

SB: But in the end you do not completely rule out this idea of a violation? It is not necessary, but still if He wanted, He could…

NG: Absolutely. I am a scientist, and as a scientist, by definition, I say that this is the evidence I have seen until today, the conclusion that I have drawn from what I have read and understood, but I am not so completely close-minded to say that I would never change my mind if somebody shows me a better understanding or stronger evidence. But putting together all these ideas of how to read the Qur'an, how to understand the stories of the Prophets, what is the meaning of God's order, what are the laws of God and of nature etc., all of this for me rules out the idea of miracle as a violation of laws. Miracles are very lucky events, providence, coincidences.

SB: What about the famous passage of the splitting of the Moon?

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[12] I am here echoing Q 2:117: 'To Him is due the primal origin of the heavens and the earth: When He decreeth a matter, he saith to it "Be" and it is.'

NG: The splitting Moon: I certainly do not believe that this was a physical occurrence, and I've explained that case in some detail in my book.

SB: Can you please expand on the historical role of the concept of miracle in the philosophical tradition you are referring to?

NG: Yes, I think that the big clash between the Mutazili rational school of *kalam* and the Asharites came down to the question 'Does God intervene at every instant and decide to do something one way or another?' The Mutazili would say that there are laws, there is order, that God has put together a plan for the world to follow. The Asharites would claim that in that sense God is not intervening at every moment or perhaps not even at *any* moment. And they wanted to make sure that in our theology there is plenty of room for God to be there at every instant. In the famous example of Al-Ghazali, you throw cotton into the fire and it may not burn if God would decide so at that moment. I think that is the fundamental difference of understanding; it is really a serious, fundamental theological issue. Understanding, conceptualizing how God relates to the world, how He created the world, its purpose according to Him, and how we relate to Him. My current position is that God interacts with us through the spirit, meaning our mental connection with Him, not through the physical mechanisms.

SB: A last question. I really appreciated your book, however sometimes I have a feeling that it ends where it should start, one would like to know more! I feel that you have rather been setting an agenda, describing the state of the art and tracing the outline of work to come. You touch upon many points in progress: Islam and evolution, Islam and quantum physics, cosmology, intelligent design etc...When it comes to your personal commitment, where will you be personally more engaged? And in practical terms – which events would you organize, which voices would you like to bring in?

NG: First of all, in the short term I need to get this book in the Arabic version. I have a rough draft and I need to polish it and finish it. Over the next two years I will be involved in an educational project on Islam and science, with talks, workshops and so on, discussing it on different topics: biology, cosmology, environment, philosophy, history... In the longer term, I think that the major topic is divine action, the relation of God to the world. When you say 'divine action' you are already assuming that God acts, and perhaps you immediately think that God acts physically, so I prefer to call it 'God's relation to the world'; and this includes of course the discussion of the possibility of miracles, of the everyday action towards humans, the meaning of the 'connection' and the fact that God 'sustains' the world, the laws. All these issues need to be investigated more thoroughly: philosophically and theologically with the enlightenment of science. Much longer than that I cannot really project, it is very hard for me to see beyond five years.

SB: Thank you very much Nidhal!

NG: Thank you very much Stefano!

After some more warm words of encouragement on Nidhal's part for my enterprise, and some more words of gratitude on my part, I logged out and switched off the computer. It was a quiet Swedish evening; the summer would soon turn into autumn. I looked at my bookshelves that, over the past years, had been gradually filled up with books about Islam and science.

Four years separated me from the Egyptian evening when I first read about the splitting Moon, but it felt like a lifetime. It was time to think through all the texts and the conversations I had collected.

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Afterthoughts

The six conversations have exposed us to a number of ideas, theories and suggestions. The time has come – if I am allowed to use a poetic expression – to recollect them in tranquillity. Let us first recapitulate the overarching, intertwined questions that have so far guided the investigation. Which contemporary authors discuss the harmony of Islam and science? What are their commonalities and differences with the earlier discussions of Bucaille, al-Faruqi, Nasr and Sardar? Which stances do such authors assume towards each other's positions? How do they interpret concepts such as miracles, biological evolution, or divine action? How do they respond to adversary theories?

In the course of the conversations I have let my interlocutors speak in their own voices and from their own horizons, prompting them to articulate their views or to deepen specific points. There is no need to repeat here the caveats stated in the *Introduction* that concern all the shortcomings of the conversational form, nor does my reader need to be reminded that there is no such thing as a completely objective study, an examination in which the very act of scrutinizing does not change what is scrutinized. However, in the following pages I will assume as established empirical material the content of the conversations, as well as the reconstructions in which they have been framed, and I will attempt to draw some general and critical remarks, therefore directly intervening in the debate that I have observed so far. In other words, what follows represents my effort to think through the theories and ideas exposed thus far by identifying interactions, analogies, discrepancies, difficulties and open questions that might not have been apparent upon first reading, while setting up an agenda for further investigation and discussion.

In the first section I delineate a definition of Golshani, Altaie, Guiderdoni and Guessoum as a 'new generation' of authors who discuss the harmony of Islam and science opposed to Bucaille, al-Faruqi, Nasr and Sardar, but also to Yahya and El-Naggar who are merely considered as contemporary advocates of Bucailleism. I then proceed to problematize and deconstruct this very definition. In the second section I identify the main elements of Bucaille's ideas, and subsequently I analyse Yahya and El-Naggar's respective argumentations in order to draw more detailed pictures of what somewhat hastily passes by the name of 'Bucailleism' (or is ignored as such). Whereas Yahya and El-Naggar are often criticized as pseudo-scientific and therefore negligible, I argue that the fascination they exert on their audience can be explained in terms of different specific argumentative or rhetorical strategies, whose success is indicative of interesting cultural dynamics. In the third section I examine the way in which the authors of the 'new generation' criticize and discuss Bucailleism, as well as their stances towards biological evolution and history. A separate sub-section is dedicated to my interlocutors' interpretation of miracles. In so doing, I try to reveal some perhaps unsuspected analogies of my interlocutors, and a much more dynamic and nuanced picture of the debate at stake than the one that the definition of a 'new generation' might induce us to perceive. In the final section, drawing upon the most recent work of the French sociologist of science Bruno Latour (b. 1947), I argue that an *objectivist* tendency pervades the whole debate about Islam

and science and I propose that it is by distancing itself from such tendency that the 'new generation' (or any 'new generation') can attain autonomy and maturity.

1. The Starting Hypothesis: A 'New Generation'

Early on in the course of my investigation, I developed the conviction according to which the contemporary debate on Islam and science is characterized by the emergence of a 'new generation'. This, *in nuce*, was the line of my argumentation. On the one hand, we witness the survival and amplification of Bucailleism, which has simply found congenial channels in the new media and is represented by authors such as Harun Yahya and El-Naggar – who might be deemed pseudo-scientific and unsophisticated but are still worth studying as cultural phenomena. On the other hand, we have some authors, including but not limited to Golshani, Altaie, Guiderdoni and Guessoum, who might be defined as a 'new generation' by virtue of the possession of five defining traits. *Each trait can be defined as a necessary and non-sufficient condition to belong to the 'new generation' or, conversely, that not one among Bucaille, al-Faruqi, Nasr and Sardar, entirely possessed.* Let us consider such traits in greater detail.

(1) All the authors belonging to the 'new generation' are natural scientists who are, or have been, engaged in scientific teaching and/or research at university level. (2) The authors at stake recognize that the scientific method cannot be changed and therefore do not advocate any kind of 'Islamization' of science. (3) The 'new generation' is open towards the possibility of theistically interpreting biological evolution. (4) The 'new generation' distances itself from Bucailleism. (5) Whereas the older generation considered Islam to be in harmony with science by virtue of a privileged relationship (as the exclusive repository of concepts with which science should be reformed *or* as the only scientifically validated religion), the 'new generation' simply accepts that Islam can be in harmony with science *qua* religion or at least on a footing of equality with other monotheistic religions.[1]

This definition seemed to mirror some features identified with clarity by my interlocutors. As we have seen, Guessoum himself in the course of our exchange approved it. However, I tried to question my own views and on closer consideration I could soon identify some substantial methodological shortcomings in the elaboration of this very definition. First of all, it is based on the distinction with the stances of four authors focused upon by Stenberg. Stenberg's study is based, in its turn, on a selection. Hence, identifying a 'new generation' in the terms I have described depends on successive, artificial restrictions of the authors investigated. Secondly, the very identification of a 'new generation' runs the risk of artificially overshadowing the extant importance of the theories of the authors studied by Stenberg, all of whom still have a cultural impact, albeit in different ways and on different audiences. Thirdly, the expression itself 'new generation' seems to be based on a misleading (or at best

[1] I develop and defend this classification in Bigliardi 2013b.

extrinsic) chronological criterion, and is devoid of any specific indication as to the actual attitudes of the authors it intends to define. Fourthly, the definition as I have sketched it relies on heterogeneous observations, the first one being sociological and the remaining ones pertaining theoretical stances. Finally, the 'new generation' thus identified still displays similarities with the overarching traits recognized by Stenberg in the authors he studied. In the case of my interlocutors one can also remark that they are cosmopolitan intellectuals who did not receive a formal religious education, and speak in the name of 'Islam', trying to redefine it and affirm its significance in a world dominated by science. In addition to these specific shortcomings, it should also be observed that the very identification of a general definition seems to run contrary to the spirit itself with which I embarked on my investigation of the contemporary debate of Islam and science, aimed at representing its richness and complexity; for instance, it induces us to easily dispose of Yahya and El-Naggar after labelling them as Bucailleists.

The philosopher John Langshaw Austin famously observed that, '(...) we must at all costs avoid over-simplification, which one might be tempted to call the occupational disease of philosophers if it were not the occupation'.[2] Similarly, while discussing an older attempt at grouping the different participants in the debate on Islam and science in different currents, Ziauddin Sardar remarked: 'If we attribute beliefs simply by drawing superficial similarities between authors, we end up producing strange assimilations.'[3] In the interest of brevity, I will stick to the usage of the expression 'new generation' in the next pages in order to refer to Golshani, Altaie, Guiderdoni, and Guessoum; however, I will make an effort to think through the definition that I have attached to that very label and try to attain a more nuanced and critical representation of their views as well as of the so-called Bucailleists.

2. Not all Bucailleists Are Equal

2.1 What Did Bucaille Really Say?

In order to carry out my self-criticism, I will begin by observing once more, and in greater detail, which ideas can be actually identified in an author whose presence, for good and bad, still seems to permeate the contemporary debate either through his present avatars or as a constant polemical target: Maurice Bucaille. The term 'Bucailleism' has been so far generically referred to the continuation of Bucaille's ideas, rather interchangeably with the expressions 'scientific interpretation' (*tafsir 'ilmiy*) and 'scientific miracle/miraculousnesss' (*I'jaz 'ilmiy*) of the Qur'an. Furthermore, during the conversations it has been assumed *heuristically*: I have namely let its intended meaning emerge from the discussions developed by my interlocutors, rather than stipulating that very meaning at the beginning of the conversations. Here, at the cost of appearing pedantic, I will briefly list the specific ideas to be read in the French author's

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[2] Austin 1962, 38.

[3] Sardar 1989, 111.

books. I can identify nine main theses, or ideas. It should be remarked that Bucaille expanded on them at different lengths and that, of course, those very ideas or the specific way in which Bucaille argued for them, can be criticized form various perspectives. Furthermore, it is not intended that Bucaille was original in any of his statements. What is relevant for the present analysis is that they are *all* identifiable in at least one passage of Bucaille's works,[4] and that they can be distinguished since none of them is necessarily linked to (or necessarily entails from a logical point of view) the other ones. What did Bucaille *really* say?

(a) The Bible does not stand any examination carried out with a scientific and analytical outlook, that is, it contains logical mistakes as well as descriptions of natural phenomena that contradict scientific observations.[5]

(b) The Qur'an does not contain any logical inconsistency or any passage in contradiction with science.[6]

[Bucaille emphasizes the opposition of (a) and (b).]

(c) Science and religion in Christianity and the West historically clashed, as exemplified by the case of Galileo.[7]

(d) The harmony of Islam and science has its historical proof in the past 'Golden Age' of Islam.[8]

[Bucaille emphasizes the opposition of (c) and (d).]

(e) The Qur'an mentions with utmost frequency natural phenomena *and* invites the reader to consider them as signs of God.[9]

(f) The Qur'an contains passages in accordance with (what Bucaille considered as) *scientifically tenable theories*, such as 'creative evolution' (contrasted with Darwinian evolution).[10]

(g) The Qur'an contains passages that accurately describe *general natural phenomena currently ascertained by science but unknown at the time of revelation,* such as the development of the foetus in the mother's womb.[11]

(h) The Qur'an contains passages that accurately describe *specific historical facts currently ascertained by science but unknown at the time of the revelation*, such as the conservation of the Pharaoh's body as well as the exact causes of his death.[12]

(i) The Qur'an contains passages that (seem to) foretell *contemporary scientific-technological developments*, such as the exploration of space.[13]

[(b), (f), (g), (h), (i) are presented by Bucaille as a *demonstration* of the divinity of the Qur'an.]

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[4] Among its innumerable editions, I am here referring to a version of Bucaille 1976 available on the Internet: www.islambasics.com/index.php?act=download&BID=4

[5] Cf. Bucaille 1976, 23–33 and 71–79.

[6] Cf. Bucaille 1976, 163 (although this is what we might call the 'spirit' that permeates all of Bucaille's works).

[7] Cf. Bucaille 1976, 80.

[8] Cf. Bucaille 1976, 80.

[9] Cf. Bucaille 1976, 113–115. It can be discussed whether this point might be split in two.

[10] To this topic is dedicated the entire Bucaille 1984.

[11] Cf. Bucaille 1976, 135–137.

[12] Cf. Bucaille 1976, 156–157; Bucaille 1990; Bucaille 1994.

[13] Cf. Bucaille 1976, 84.

[Moreover the epistemology underlying at least (e), (g) and (h) is a distinction between 'theories', changeable and provisional, and 'facts' ascertained by science once and for all.]

Equipped with this essential map, we can start exploring the other authors studied so far while drawing more fine-grained distinctions.

2.2 Harun Yahya or the Birth of Theoscientography

Other interpreters and critics of the contemporary debate on Islam and science have reconstructed in detail Harun Yahya's placement in the Turkish contemporary socio-historical milieu, and demonstrated his continuity with extant or historical debates.[14] The aim of the following examination is to propose a complementary reading based on the observation of the logic behind Yahya's works touching upon the Qur'an, God and nature. In other words, I will attempt to dissect three fundamental elements of the logic underlying Yahya's 'philosophy of nature' and argue that their interaction captures the defining traits of Yahya's interpretation in a much more stringent way than simple reference to Islamic creationism and/or Bucailleism.

Let us observe in detail three features of the works in which Yahya discusses the relationship of God and nature. We have, in the first place, what I am inclined to call *argumentative theology*: Harun Yahya refers to the Qur'an, that is, to *revealed* knowledge, whose truth is treated as self-evident. However, Yahya's discourse is *not* prevailingly shaped as a paraphrase to the Qur'an, a lyrical diffusion on faith-related topics, a narrative hagiography centred on the Prophets, nor as moral exhortation to follow a religiously inspired code of action. What is instead prevalent in Yahya is *argumentation*.[15] God's existence (and hence faith) is taken as the object of a structured, 'rational' argumentation within which proof is given and discussed. The second fundamental element of Yahya's discourse is, in my view, *scientification;* one can also say that the structured discussion of God's existence is 'scientified'. By 'scientification' I mean the attempt at *bestowing within the whole message the prestige and trustworthiness commonly envisaged in the natural sciences*. Such 'scientification' is obtained through three different yet intertwined strategies: Yahya's works are written in a style that mimics scientific popularization with, for instance, quotations from scientists, usage of schemata and 'data', footnotes (albeit incomplete ones) and so forth. Yahya's discussion attempts to present itself as 'more scientific than science'[16] by targeting the famous (and famously connected to science) theory of Darwinism as its antagonist; such a theory is apparently discussed on an equal

[14] Most notably Anne Ross Solberg in her recent monograph (Ross Solberg 2013).

[15] This might be seen as being latently in conflict with the continual appeal to the existence of God as a truism and faith in His existence as inevitable.

[16] I owe this expression, as well as the suggestion of Scientology-related examples, to Josef Schovanec's highly inspiring talk 'More Scientific than Scientists. When Extreme Scientific Narratives Become a PR Strategy of New Religions', delivered on Friday 2 March 2012 at the conference *Religions, Science and Technology in Cultural Contexts: Dynamics of Change*, organized in Trondheim by the Norwegian University of Science and Technology.

footing with experts by criticizing it, offering 'proof', asking for counterproof and so on. Yahya takes proof as the 'facts' of the 'natural world' that are presented as what natural sciences examine or is constituted of. Finally, but not less importantly, we have in Yahya's works the constant *visual representation of facts.* In other words, the 'facts' discussed fuse and practically end up coinciding with the *graphic representation of facts* that constitute a 'graphic hyper-reality' *in which the verbal discussion is literally inscribed.* I use the term 'hyper-reality' to refer to the fact that the pictures are doctored and assembled in order to enhance their visual appeal. The beauty with which they are then conceptually associated in the verbal part of the discourse becomes itself a 'fact' that is used as a 'proof'. This, in my view, should be considered as an *intrinsic feature* of Yahya's discourse, and is the graphic counterpart of Yahya's imitation of scientific popularization and of the emphasis placed on facts.

For the special interaction of such elements as it is represented by Yahya's message, I propose the name *theoscientography.* The first element of this somewhat odd (and, I must admit, not necessarily beautiful) portmanteau refers to the 'rational' theological side of the discourse; the second refers to the 'scientification'; the suffix recalls the graphic element – yet the ancient Greek *graphein* can mean both 'drawing' and 'writing' and the resulting ambiguity, in my opinion, strongly underlines the inextricable interaction of the verbal and the visual that I perceive in Yahya's work.[17]

I argue that the three traits constituting theoscientography are independent of each other; furthermore, the second and the third are not necessarily elements of religious cultural products; finally, none of the three is necessarily 'Islamic'. Let us consider some examples: concerning the first observation it can be remarked that, although the demonstration of God's existence through reference to the beauty and order of the universe has a long and honourable tradition, theology can well be presented and undertaken as a structured, argumentative enterprise without necessarily taking the 'facts' of the 'world' as proof of God's existence. For instance, John Hick (1922–2012) mainly devoted his theological work to the defence of the rationality of faith as an epistemic phenomenon that one can consistently assume.

I see scientification as a communicative strategy that is parasitic to other forms of production thematically connected to science itself and technology, such as scientific popularization. Scientification is a common strategy in marketing: quite banally, we have an example of scientification whenever a shampoo is advertised by referring to its 'pH', or whenever the virtues of a toothpaste are exalted in an advertisement with an actor portraying a dentist in a white coat (although both the shampoo and the toothpaste might well be advertised by referring to equally pleasant but less 'scientific sounding' qualities such as scent

[17] New jargon is always unwelcome. However, since I am defining in a rather rigorous way what is meant by the term, and since my point is precisely that it corresponds to a new form produced by Yahya (but not exclusively Yahya's) and is beyond his own intentions, I still think the existence of a new specific term is justified. I hope my reader will perceive this as a compromise that is sufficiently balanced. Furthermore, given my definition step by step, those who might disagree with me will be able to criticize 'theoscientography' analytically rather than by pointing at the undisputable fact that the word is clumsy and technical.

and taste, respectively). It should also be pointed out that scientification can often be detected in new religions, especially as a proselytizing, ice-breaking strategy. For instance, it is a common experience that Jehovah's Witnesses, while approaching potential converts in person, do not initially describe the most controversial elements of their faith nor the strict rules of conduct and the hierarchical structures that characterize their religious life, but rather propose a 'biblical study' so that a religious message is presented with the credentials of a scholarly, objective discipline. There are even more poignant examples: the Raelians' official website hosts a regularly updated page of scientific news, therefore proving themselves to be 'science friendly' and scientifically updated.[18] In its proselytizing activities, both in person and on the Internet, Scientology (which evidently attempts to hijack science's prestige from its very name[19]) tries to be 'more scientific than science' while antagonizing psychiatry[20] – certainly not by stating right away the somewhat extravagant, sci-fi-like doctrine that actually characterizes Ron L. Hubbard's (1911–1986) church. Finally, the construction of a visual hyper-reality is not necessarily encountered in a religious context: all the magazines devoted to scientific popularization the world over count on the visual appeal of the 'facts' they represent to sell more copies. Furthermore, there are instances of the usage of pictures in a religious context analogous to that of Yahya. A telling example is the illustrated booklets distributed by Jehovah's Witnesses that constantly present enticing pictures of nature and the universe, either in order to argue in favour of the existence of a Creator or to depict the afterlife – the delights of which are shown as a hyper-reality in which all visual and sensorial qualities of the present world are exalted.[21]

It should be emphasized that my proposed classification is not at all intended to downplay or conceal the pseudo-scientific elements of Yahya's message. It should be clear at this point that 'scientification' is *not* science. It indeed relies on (and encourages) a caricaturized, impaired and misleading representation of science as being all about 'facts'. Moreover, it is also clear that Yahya incorporates specific pseudo-facts in his message. However *Yahya's message is not pseudo-scientific because it incorporates anti-Darwinism: on the contrary, it incorporates anti-Darwinism because it is pseudo-scientific.* Looking at the deeper logic of its production we see, in other words, that the criticism of biological evolution is just an expression and reflection of the 'scientifying' strategy. As a result of (and

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[18] Cf. http://raelianews.org/news.php?item.485.2.

[19] Cf. http://www.whatisscientology.org/?utm_source=google&utm_medium=text&utm_term=scientology&utm_content=infographic&utm_campaign=wis&gclid=CJys07XVz7YCFRF2cAodAksAyg#definition.

[20] My reader can easily yield a considerable number of examples through a quick web search for 'psychiatry', 'industry', and 'death' on YouTube.

[21] Cf. the representation of afterlife in http://www.jw.org/en/publications/books/a-peaceful-new-world-will-it-come/1101991230/. For a study of the iconography of Jehovah's Witnesses with examples relevant to my argumentation, see as well cf. Elliott 1999. I have found the usage of landscape, cosmic and biological pictures together with a verbal appeal to their beauty and order as a means to demonstrate the Creator's existence, comparable with Yahya's, in at least one booklet distributed online by Jehovah's Witnesses: *Lasting Peace And Happiness – How To Find Them* (2009, available at: download.jw.org/files/media_books/5d/pc_E.pdf; cf. 9–12).

consistently with) such a strategy, Yahya might well have decided (or may decide one day) to antagonize, say, black holes or light speed; for instance, he might claim that they are an insult to God's power, argue that they are not observable, vocally challenge Stephen Hawking in the press and so forth.

Arguably, most of the scholars who have approached Yahya as a polemical target or a cultural phenomenon so far have perceived or presented his message as an odd patchwork – both from the point of view of his mode of production and the specific ideas he propagates. He might have been seen as a hyper-technological version of Bucailleism. Otherwise, they have engaged in a discussion on creationism while missing the deeper logic behind the message itself.

In my view, we do not grasp the inner logic of Yahya's production (and therefore its possible developments) as long as we solely describe him as an 'Islamic creationist' (a label indeed liable to be applied to various, dissimilar authors). What might escape one's attention is that Yahya's rearrangement of pre-existing ideas together with new modes of production and propagation in fact results in something qualitatively new. Specifically, scholars whose attention is more accustomed to diction might be tempted to regard Yahya's graphic element as extrinsic whereas, as I have argued, it is essential to his message. In particular, the graphic element of Yahya's message marks a qualitative turn in his production if compared to Bucailleism.[22]

One can also ask what is *Islamic* in Yahya's message. I am not essentializing Islam here by pointing at a 'core doctrine' in order to argue that Yahya disrespects it or deflects from it, but I am rather referring to the frequency of references to Qur'anic passages, Muslim authors and traditional doctrines in Yahya's message. As I see it, the Islamic element influences some thematic and stylistic devices in Yahya's overall production (usage of Qur'anic verses, Mahdism, specific narratives) and some modes of production concerning Yahya's visual hyper-reality – for instance, a direct representation of God is not allowed. Yet the presence of Islamic elements has to be considered in the context of, and compared with, other elements of such a message. For instance, an inspection of the *Atlas of Creation* reveals that Islamic/Qur'anic references and narratives are somewhat marginal. As I see it, Islam in that case rather provides an extrinsic garb in which Yahya's religious message about God and nature is wrapped. In other words, Islam is not constitutive of the inner logic of Yahya's *Atlas of Creation* – that is, the scientification of a religious message. *Theoscientography* is not exclusively Islamic, nor is Yahya's works; it is rather comparable to a *TV format.* One can well imagine, for instance, a Hindu theoscientography. In order

[22] Nathan Schneider appears to be on the right track when he points out: "One can glean a sense of the beauty Oktar has in mind with a glance through his books, for which he supervises the design himself. In most, the pages are glossy and packed with colorful pictures and photo collages. They portray a bright, magical world of divine order and harmony, with brilliant landscapes, marvelous machines, and every kind of living thing. Nothing is uncertain or ambiguous. Children smile and adults drive expensive cars. In contrast, everything under the influence of Darwinism lives in a shuttered, incoherent darkness. "The author's books are all extremely convincing," says *The Atlas of Creation*'s prefatory note. And, even if only for fleeting moments, I found this to be true" (Schneider 2009). Analogously, Torsten Janson briefly points out the relevance of the illustrations in Yahya's books, emphasising the connection with the work of Bucaille (Janson 2003, 103-104).

to better describe Yahya without losing reference to Islam, I therefore propose to define him *not* as an extravagant, vocal Islamic creationist but as *the main contemporary producer of theoscientography in Islamic garb.*

It is my conviction that Yahya's appeal, despite his extravagance, should be taken as indicative of some cultural dynamics. Relevant in such dynamics is of course the way in which biological evolution is taught, perceived and discussed in the Muslim world. However, there is more to the picture than this. The fact that Yahya can find so many sympathisers points at some objective difficulties in understanding and popularizing not just biological evolution but, more generally, natural science. I namely see the existence of theoscientography as parasitic on what can be called, with Lewis Wolpert's famous expression, 'the unnatural nature of science', the non-commonsensical (and therefore easily misunderstood or misrepresented) method and object of science;[23] with science's prestige all are exploited in a media-savvy way.[24] Who should be concerned with theoscientography? Rather than the advocates of a specific position in the debate on religion and science, it is all those who are first and foremost interested in setting up a discussion based on correct information concerning the nature and role of science, who respect the canons of a rigorous, scholarly exchange of ideas and who are interested in the popularization of scientific theories.

Let me summarize my observations: with Yahya, Bucailleism is fed with material drained from Christian creationists, its anti-Darwinism becomes prevalent and it encounters image technology. In this way it becomes something new and expendable in other religious contexts. In *Human All Too Human* (1878) Friedrich Nietzsche compared an author's work to the part of an insect that, after having been severed, takes on 'a life of its own' and it continues on its own way.[25] This is what might well happen to Yahya's newly assembled genre. Time will verify or falsify my hypotheses regarding theoscientography's potential to also be assumed by other religions. What should be more relevant to all those interested in engaging in the discourse on Islam/religion and science is to grasp the deep, unprecedented logic of theoscientography, the factors (and easiness) of its production, its appeal and its expendability in different religious contexts; therefore it should be criticized as such instead of simply attempting a piecemeal refutation of what is advertised through theoscientography from time to time, or poking fun at a specific author currently associated to its production.[26]

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[23] Cf. Wolpert 1992.

[24] As Taner Edis points out '(...) it is a lot easier to emphasize how crazy evolution sounds than to explain why it works' (Edis 2002, 76). In this sense, the Yahya phenomenon does contain an important teaching concerning scientific communication, scientific culture and scientific education. It might also be legitimate to ask whether Yahya's misunderstandings were, in the first place, personal and genuine, or if they are intentionally induced in the readership and cynically exploited to promote and nourish Yahya's overall message.

[25] Nietzsche 1878, § 208.

[26] I have tried to express similar concepts in Bigliardi 2013a and Bigliardi 2014.

2.3 El-Naggar: More Bucailleist Than Bucaille

At first glance, El-Naggar's message might seem to be a more standard avatar of Bucaille. However, whereas we can identify in his works, as well as in the conversation reproduced in this book, all of Bucaille's ideas that I have previously mapped, El-Naggar's way of framing them (including some stylistic traits) apparently differentiate the French doctor and the Egyptian geologist.

First, a prevalent trait of El-Naggar's discussion is the tendency to emphasize contrapositions. I can attempt to outline here a short list in which the first element indicates the concept(s) or attribute(s) towards which El-Naggar himself is favourably inclined: the superior comprehension of the Qur'an on part of Arabic native speakers versus the insufficient understanding of non-native speakers; Islam's compatibility with science versus other monotheistic creeds' scientific contradictions; creation versus evolution; the Qur'an's integrity versus the manipulation of the Torah and the Gospels; literal versus metaphorical interpretation of the Qur'an; (what El-Naggar identifies as) Islam proper versus Sufism. Some of these contrapositions are obviously present in Bucaille, but what seems special in El-Naggar's language is their pervasiveness. Second, one can observe in El-Naggar's language a constant appeal to vivid images and illustrations that rather belong to the imagery of preaching, such as the devil (whose mention I was rather surprised to hear only a few minutes after the beginning of our conversation), or the 'deviation from a straight path'. Interestingly, it is also in terms of 'deviation' that El-Naggar represents the shortcomings for which Bucailleism is often blamed. As the attentive reader surely has noticed, I have specifically tried to tactfully touch upon the most classical criticisms of Bucailleism as relying upon and encouraging pseudo-science. The response on the part of El-Naggar consisted in defending the approach *per se* as sound, while admitting that some individuals can always make mistakes: some exaggerations might occur, yet the general method, according to El-Naggar, remains solid and fruitful. Third, all such sharp oppositions are somewhat rhetorically softened by El-Naggar referring to the meekness and respect with which the deviations should be treated: therefore, the 'negative terms' of the oppositions that I have mentioned are condemned but not attacked. Fourth, El-Naggar's language displays a special repetitiveness of formulas and a peculiar insistence on key topics such as the absolute clarity of the Qur'an and the simplicity of Islam (once again, contrasted with the multiplicity of currents he sees in Christianity). Islam, in El-Naggar's words, is presented as transparent and monolithic. Analogously, he conceives of his own work as the continuation of something that has been said and done before; new work is described as mere expansion of a pre-existing one, not leading to any radical change nor potentially open to conceptual turns.

Notwithstanding his claim according to which he first and foremost addresses a readership of intellectuals, I rather suggest that El-Naggar's public is mainly constituted of laypeople in matters relating to physics, and that he proves most appealing to an audience that lacks a thorough scientific education, if not an education at university level. To this kind of public, El-Naggar can present himself with the traditional prestige of a natural scientist: this was of course a point of strength of Bucaille. However, there seems to be a fundamental

distinction. El-Naggar cannot count on the appeal of a Western convert. With Bucaille, a convert scientist validated the Qur'an's 'scientific character'. The exegesis gained its strength from the prestige of its 'exotic' element in the eyes of a Muslim public. Bucaille *impressed* his audience as a foreign scientist who preached Islam; El-Naggar instead *reassures* his audience as an autochthonous preacher who blends Islam and science, and jealously defends his authority in both fields according to criteria that disqualifies Bucaille himself as an interpreter of the Qur'an. We can state that El-Naggar holds an elitist stance, both as to the understanding of science and of the Qur'an, that turns out to be 'more Bucailleist than Bucaille'.

3. Tales of Complexity

3.1 Scientific Exegesis, Historical Narratives, Biological Evolution Titanic Struggle, Game of Mikado or Dialogue of the Deaf?

I have stated that the 'new generation' distances itself from Bucailleism. At first glance, one cannot but agree with this observation. *Prima facie*, the 'new generation' might even seem to be engaged in a titanic struggle against Bucailleism. Indeed, mention of Bucaille apparently elicited quite critical remarks from Golshani, Altaie, Guiderdoni and Guessoum. And undoubtedly, the kind of intellectual production in which the four physicists are engaged is far from coinciding with the 'scientific exegesis' or 'scientific miracle' of the Qur'an. However, we cannot just be content with these observations. We shall rather ask, in the light of the map of Bucaille's theses that I have sketched above, two intertwined questions. Which *specific* ideas have been actually criticized by my interlocutors under the umbrella term 'Bucailleism', and *how*?

Golshani warns about the identification of scientific notions in the Qur'an for at least three interweaved reasons: he points out that this kind of exegesis should not be favoured over the direct investigation of the natural world; he remarks that it wrongly provokes the treatment of the Qur'an as a catalogue of scientific facts and not as a book of guidance, and he recalls that scientific theories change so that the supposed correspondence of the Qur'an and science cannot be taken as decisive validation of the Qur'an itself. [27] Altaie mainly criticizes the incompetence of those authors who embark on the identification of scientific notions in the Qur'an[28] and, concerning various (not better specified) claims by El-Naggar, the Iraqi physicist observes that some are not verifiable, some are correct if contextualized and others are plainly wrong. Interestingly, Altaie also mentions the change in scientific theories, but he rather does so in order to reassure us of the fact that what might appear as a discrepancy between scientific notions and Qur'anic passages might be resolved by a development of science itself.[29] Altaie states as well that the Bucaillean approach has allowed a majority

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[27] Cf. also Golshani 2003, 148–151.

[28] Cf. also Altaie 2007, § 7.

[29] In our conversation, it remained unclear whether this should be interpreted as a specific prescription to develop science in the direction of a Qur'anically compatible theory or discovery. It

of 'ordinary' people to acknowledge 'the Qur'an's scientific and intellectual expression'.[30] Guiderdoni maintains that Bucaille was sincere in his approach; however, in our conversation he describes Bucailleism as shallow or 'bad science' and 'bad theology' that inverts 'the way things should be done'. What Guiderdoni seems to be saying, thus, is that scientific facts should be the object of a properly scientific enterprise, and that theology in its turn should not be exclusively reduced to the identification of scientific notions in the Qur'an.

It is Guessoum who apparently has the most articulate interpretation. The Algerian physicist namely recognizes that Bucailleism can have an 'allure' for less scientifically informed minds, as he himself was before taking up his physics studies. In this sense, and given that a sophisticated comprehension of science and religion are not open to everybody, Bucailleism seems, in his reconstruction at least, to naturally fulfil or express a cultural role or need. However, Guessoum shortly expresses harsh remarks about the 'scientific miraculousness' of the Qur'an that he defines as 'dangerous (...) philosophically and intellectually, dangerous even Islamically'. In an essay that deals extensively with the interpretation of the Qur'an in the light of science, Guessoum insists on the distinction between 'scientific interpretation' (*tafsir 'ilmyi*) and 'scientific miracle' (*I'jaz 'ilmyi*) of the Qur'an. In his presentation, the former is the kind of exegesis that is aimed at illuminating the content of at least some Qur'anic passages that mention natural phenomena, by recurring to updated scientific knowledge; the latter is the identification of specific scientific notions, inventions and discoveries supposedly foretold in the Qur'an.[31] However, Guessoum recognizes that Bucaille stands midway between the two trends, as it also emerges through my identification of Bucaille's ideas respectively labelled as (e), (g), (h) and (i).[32] Guessoum acknowledges as well that some advocates of this trend are highly educated and sincere in their approach,[33] and describes the *I'jaz 'ilmiy* as 'a snowball that started out small and white but then rolled and collected rubbish (ignorant contributions); it has become a mass of dirty ice that easily melts under the intense light of objective and methodical scrutiny'. At the same time, Guessoum believes that it is possible to salvage, clean up and redirect such an approach, 'at least for the general public',[34] by rejecting 'all extreme positions'.[35] Guessoum's position is also interesting by virtue of the way in which he levels some counter-objections to other critics of the scientific interpretation and scientific miracle of the Qur'an; he namely summarizes several 'classical' objections to the approach: other critics, Guessoum points out, have stated that it leads to assigning untenable meanings to Qur'anic vocabulary, that it downplays

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should also be remarked here that, notwithstanding the abysmal differences in their scientific competence and in the details of their contributions, both Golshani and El-Naggar seem to agree with the principle according to which Qur'anic compatibility is the criterion to be followed in choosing among competing scientific theories.

[30] Cf. Altaie 2007 § 4.

[31] Cf. Guessoum 2008, 421.

[32] Cf. Guessoum 2008, 420.

[33] Cf. Guessoum 2008, 422.

[34] Cf. Guessoum 2008, 425.

[35] Cf. Guessoum 2008, 428.

the occasions of revelation as well as the sociocultural context of the revelation, that it projects into the perfect Qur'an the imperfection of human sciences and that it is an elitist approach. However, Guessoum regards all of these objections as 'not serious' since in his view they disregard that the Qur'an is not bound to the specific context of seventeenth-century Arabia and it is always open to multiple interpretations by readers with different intellectual inclinations or mind-sets. [36]

What emerges then is a much more nuanced confrontation than what one at first glance might have thought: a subtle Mikado match rather than a titanic struggle. In the famous game, the different players try to pick up as many sticks as they can from a bundle without moving the other ones and in successfully doing so, they also deny their adversary the opportunity of picking up those very sticks in her turn. The one who gets more sticks wins. Something similar seems to be happening in the confrontation between the 'new generation' and Bucailleism, now meant as the bundle of arguments that were popularized by the French author. My reader is invited to refer again to the map of Bucaille's theses I have beforehand delineated. What is at stake in the criticisms voiced by Golshani, Altaie, Guiderdoni and Guessoum while discussing 'Bucailleism' are principally the points that I have identified as (e), (g), (h) and (i). However, what is prescribed is a cautious approach; none of the points is really knocked down: the sticks are meticulously withdrawn from the adversary, they are not rejected. It is namely recognized that such lines of interpretation become errant if exaggerated or practised by interpreters incompetent in specific scientific matters or with a naïve philosophy of science – it is the adversary's ability to take them up and to use them that is challenged, but not the substance of the lines of interpretations themselves. I will return later to other points. What seems almost absent or at least not emphasized by Golshani, Altaie, Guiderdoni and Guessoum is the argument (presented as complementary to the other points and quite insisted upon by Bucaille) that the Bible is instead inconsistent when it comes to the mention of scientific facts (a). The 'demonstrative' character attributed to the presence of scientific notions in the Qur'an also seems to be downplayed.

Johannes J. G. Jansen (b. 1942), an earlier observer of the scientific interpretation of the Qur'an, formulated a criticism of the trend at stake mixed with appreciation for its intentions and for what we might call its socio-pedagogical role. As a conclusion to a survey of Qur'anic scientific exegesis, he indeed observed:

> *'(…) one cannot help admiring the courage of certain scientific exegetes of the Koran. Whereas in Christianity it took centuries before the Churches "admitted" certain scientific truths, often after bloody struggles, many modern Moslem scientific exegetes of the Koran boldly claim that the Koran, the backbone of Islam, already contains the modern sciences and their principles, and all this with a courage and vigour that deserves a nobler aim.* [37]

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[36] Cf. Guessoum 2008, 421.

[37] Jansen 1974, 54.

One can widen the focus of the comparison between Bucailleism and the approach to Islam and science represented by the 'new generation' and ask whether and how they really compete on a socio-political dimension. The existence of some kind of intellectual competition is probably an impression well conveyed by the conversations, yet I perceive the wider question as still open to scrutiny and interpretation. On the one hand, the 'new generation' seems to rely on the criticism of Bucailleism as an important identity marker whereas, on closer examination, substantial points of convergence seem to emerge. On the other hand, some interlocutors, analogously to Jansen, recognize that Bucailleism can play a positive role for less sophisticated audiences (who can even be exemplified by the same person in different stages of his or her intellectual development, as Guessoum narrates about himself). If one pushes such observations to extreme consequences, the interaction of Bucailleism and anti-Bucailleism might even be described as a dialogue of the deaf. At one end, an 'anti-Bucailleist' author addresses readers who already have an understanding of science superior to that upon which Bucailleism relies. At the other end, a Bucailleist reader or author might well put Bucailleism and the 'new generation' in the same bag (Guiderdoni for instance hints at this possibility) considering them equal expressions of the harmony of Islam and science carried out by 'illustrious scientists' precisely by virtue of that unsophisticated outlook.[38] Simultaneously, the same Bucailleist author or reader might well meet the objections regarding pseudo-science while limiting the acknowledgement of pseudo-science to some unfortunate, isolated cases as the conversation with El-Naggar well demonstrates.

It can also be asked whether, *and to what extent*, Bucailleism (here meant as pseudo-science) competes with science for the allocation of funding from governments, and how the general perception and practice of science proper is affected by such competition in a given society. What is the relation, if any, between Bucailleistic pseudo-science and the lack of interest and competence in science proper lamented by some of my interlocutors? Is the flourishing of the first a *cause* of the second, an *effect* or a *symptom*? I feel that the answers to these questions cannot be simply taken for granted. It can even be hypothesized that Bucailleism might blossom in a scientifically well-developed society. For instance, one can imagine that a prominent scientist, who otherwise successfully practises science in her laboratory, engages in her spare time in the production of booklets dedicated to the scientific exegesis of the Qur'an in order to nourish her own religious identity, or to blandish local, traditional religious authorities (from whom she might obtain funding later employed for the practice of science proper!) with such production. Guessoum uses the apt metaphor of 'schizophrenia' to indicate the separation of religious and scientific culture,[39] but a metaphor is just a metaphor even if it is a good one. The devastating effects of schizophrenia clinically intended are known – yet the compartmentalization of scientific practice might allow a scientist to hold pseudo-scientific notions in a

[38] I have previously sketched the concept of theoscientography: It should be recognized that by its very nature it is able to absorb science. Nothing is more science sounding than genuine science!

[39] Guessoum 2011, xxvi.

field while being proficient in another. I am of course arguing in a paradoxical vein, and I am far from advocating the inexistence of pseudo-science, a concept I myself employ in the analysis of Yahya's work. What I am trying to do is to avoid trivializing the interaction of pseudo-science and science. Upon closer scrutiny, the competition of Bucailleism and anti-Bucailleism seems to be a complex match played on multiple levels (individual, social, political, pedagogical) still open to more fine-tuned analysis than the one offered on these pages.

Similar questions hold regarding two other debates touched upon in the conversations. The first debate concerns the definition of a 'Golden Age of Islam' considered as historical proof of the harmony of Islam and science (and taken as an example to follow in order to regain excellence). We have seen that Bucaille also embraces this line of argumentation (c). The second debate concerns the possibility of theologically interpreting biological evolution. We have seen that Bucaille was a staunch critic of Darwin (f) and indeed anti-Darwinism and Bucailleism seem to go hand in hand. The details of these discussions are beyond the scope of these pages and they can simply be left to other experts for future investigation and evaluation. However, it is worth mentioning here some general problems regarding the different levels on which such debates are pursued and developed.

Let us start with the historical narratives. My reader has noticed that Golshani, Altaie, Guiderdoni and Guessoum constantly carry out the discussion about the harmony between Islam and science with at least some reference to the past. Such reference is never unsophisticated but rather specific. For instance, Altaie touches upon the topicality in light of modern physics of notions elaborated by the *mutakallimun*. Guessoum chooses Averroes as his guiding spirit for the harmonization of religion and science not by simply and rhetorically referring to the fact that the Andalusian polymath was a great scientist and a Muslim, but to Averroes' specific theories about how to approach the Qur'an with a scientific mind. To my knowledge, no discussion of 'great figures of the past' plays a role in Yahya's message. El-Naggar only briefly touches upon the greatness of Muslim scientists and thinkers who, in his words, 'have been very effective'. However, while these pages were being written, the popular appeal of the narrative(s) connected to the 'Golden Age' of Islam began to be visibly exploited on a world scale with the '1001 Inventions' touring exhibit and the debate over Islam and science showing a new complex facet: the competition between sophisticated and popular historical narratives. Such an exhibition was part of a more comprehensive educational project established by the *Foundation for Science, Technology and Civilisation* based in Manchester. It was shown at the Science Museum in London, outside the Haghia Sophia Museum in Istanbul, at the Hall of Science in New York, the California Science Center in Los Angeles, the Aramco Cultural Park in Dhahran, Kingdom of Saudi Arabia and the National Geographic Museum in Washington DC, and it was paralleled by extensive publications on paper and the Internet. '1001 Inventions' obtained praise, among others, from U.S. Secretary of State Hillary Clinton who inaugurated the show in LA, and the British Crown Prince Charles. The aim of '1001 Inventions' is to uncover 'a thousand years of scientific and cultural

achievements from Muslim Civilisation from the seventh century onwards, and how those contributions helped create the foundations of our modern world'.[40] A number of scholars in different disciplines, while recognizing the 'good intentions' of such an initiative, have expressed their concern for inaccuracies and mistakes promoted by the exhibit's narrative. [41]

Also, in the case of the opposition between Darwinian evolution theistically interpreted and anti-Darwinism/Creationism, we seemingly witness a confrontation between a sophisticated and intellectual approach and a more popular one. Such confrontation has its equivalent in on-going debates in Christianity. Muslim theists can join forces with Christian theists such as the molecular biologist Denis Alexander or the theologian John F. Haught, who advocate the reconciliation of biological evolution with religious concepts and narratives.[42] The analogies of Yahya's creationism from the Christian one (or its derivation thereof) has been touched upon, as well as its expendability of his message in any other religious context. However, both in the case of the popular Golden Age narrative versus the sophisticated one, as well as in the debate for and against the reconciliation of religious concepts with biological evolution, we can identify a number of multi-layered issues analogous to those identified in the supposed struggle between Bucailleism and anti-Bucailleism. Once again, not only the specific details of the confrontation have to be worked out in greater detail by the participants in the debate, but also to external observers it still remains uninvestigated what social and psychological functions the different narratives fulfil and to what extent they compete and have an impact on different believers. It is to be hoped that further work will be taken up in such fields.

3.2 Miracles

I have so far left undiscussed a crucial point identified among Bucaille's ideas: the idea that the Qur'an does not contain any logical inconsistency or any passage in contradiction with science (b). This, of course, is the least Bucaillean of all of Bucaille's ideas, regarded as a platitude or a statement to be subscribed to by all of my interlocutors. What is interesting is to observe how this specific principle is respected, or argued for, concerning the case of miracles that seem to pose a major challenge to the harmonization of scientific and religious beliefs.

In the *Introduction* we have observed the terminological and conceptual associations of the term 'miracle' within the Qur'an. Let us take a short detour and observe the presence of miracles as a topic in Western/Christian philosophy beginning with an essential survey of which narratives are associated with the terms in the Bible. Miracles in the Old Testament are usually performed by or through prophets, in order to confirm their power and affect history. The most well-known miracles are connected to Moses and the exodus: for example, Moses' staff (or his brother Aaron's) turns into a snake (Ex 4:1–3; 7:8–12), the waters of the Red Sea are divided (Ex 14:21) and manna feeds the Hebrews in

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[40] Quoted from http://www.1001inventions.com/1001inventions/about-us.

[41] Cf. Edis and Brentjes 2012.

[42] Cf. Alexander 2008 and Haught 2010.

the desert (Ex 16:12). In Biblical Hebrew there is no single word for 'miracle' but different terms, each one underlining a different aspect of the general concept obtained by connecting the different senses: (1) *oth*, 'sign' (e.g.: Ex 7:3; Dt 4:34; 6:22; 7:19; 34:11); (2) *mophet*, 'portent' (e.g.: Ps 71:7); (3) *niphlaot*, 'wonders' (e.g.: Ps 107:24); (4) *geburah*, 'act of power' (e.g: Dt 3:24); (5) *nes*, 'signal' (only once: Nu 26:10 – later largely employed in the Talmudic literature). In the New Testament wonders are worked and signs are given mostly by Jesus but also by his apostles and later followers, for instance Paul. Different terms occur in the New Testament as well: (1) *dynamis*, 'power', or 'mighty work' (e.g.: Mt 11:20 ff.; Mk 6:2); (2) *ergon*, 'work' (e.g.: Jn 9:3); (3) *semeion*, 'sign' (e.g.: Jn 2:11; 4:54); (4) *teras*, 'portent', 'prodigy' (combined with the preceding in the expression *semeia kai* –and- *terata*, e.g.: Acts 2:43); (5) *thaumasia*, 'wonders' (e.g Mt 21:15); (6) *paradoxa*, 'paradoxical events' (e.g.: Lk 5:26).

The idea of a violation of the law of nature as connected to the concept of miracle does emerge only separately, gradually and in a later period, and the term 'natural laws' in classical and postclassical antiquity is rather associated to moral principles rather than physical ones.[43] Yet, the classical world had already developed a debate regarding the unlikelihood of the extraordinary facts reported by mythological and poetic discourse. All this concerned those religious thinkers who also discussed biblical texts in the light of the knowledge of classical philosophy, so that miracles were perceived as a challenge to credibility even before connecting them with the issue of natural laws. We shall here briefly recall Tertullian (c. 160–220) and Origen (c.185–283) who chose different strategies for dealing with the interpretation of miracles: the former denied the value of philosophy and took miracles literally; the latter preferred an allegorical interpretation.[44] A change was represented by Augustine (c. 354–430) who experienced the social relevance of miracles, which in his time began to be attributed to contemporary figures of saints and therefore played an important role in conducing pagans to conversion. He elaborated an articulated definition of a miracle, seen as an extraordinary fact, which apparently surpasses the hope or the capacity of the beholder and goes against the known course of nature.[45] The current official doctrine of the Catholic Church is nevertheless mainly based on Thomas Aquinas' (1225–1274) *Summa contra gentiles* (3.99.9 ff.). Aquinas defines a miracle as an event that stretches beyond the natural power of any created thing to produce and something of which only God could be the principal cause; he develops a refined classification of miraculous events as well (*miracles supra, contra, praeter naturam*).[46] His contribution thus marks the definitive connection of the ideas of the miraculous and supernatural, which is inherited by successive theological and philosophical thought. The concept of miracle is nowadays still central in the catholic doctrine, especially as to the praxis of canonization, while protestant theology from the very beginning has

[43] Cf. Grant 1952: 19 ff.

[44] Cf. Grant 1952, 193 ff.

[45] Cf. Bron 1979, 14.

[46] Cf. Bron 1979, 1516; Swinburne 1989, 19–22.

denied the miracles of the saints and emphasized the scriptural ones.[47] The idea of 'miraculous' has challenged important contemporary theologians, given that the supernatural aspect is still a source of embarrassment. Amongst the most important contemporary interpretations we shall briefly remember that of Rudolf Bultmann (1884–1976), who advocated a 'demythologization' of the biblical narratives, a demand allegedly dictated by scientific development;[48] similarly Paul Tillich (1886–1965) tried to drive attention from the supernatural aspect to the religious significance, assumed as the defining trait of miracles.[49]

Miracles can be said to have concerned almost every major personality of modern Western philosophy, even if their respective positions did not always develop into articulated, autonomous theories. Original points of view can be found for instance in Spinoza, Hobbes, Locke, Leibniz and Kant.[50] The most important contribution, nevertheless, is due to David Hume (1711–1776) and is to be found in the tenth chapter of his *Enquiry Concerning Human Understanding* (1748). The core of his position can be grasped through the following passage:

> *'A miracle is a violation of the laws of nature; and as a firm and unalterable experience has established these laws, the proof against a miracle, from the very nature of the fact, is as entire as any argument from experience can possibly be imagined. [...] No testimony is sufficient to establish a miracle, unless the testimony be of such a kind, that its falsehood would be more miraculous, than the fact, which it endeavours to establish.'*[51]

Hume doesn't focus on the religious significance of specific biblical miracles (he discusses rather some that allegedly occurred in a Jansenist community) and elaborates a definition along the lines of his theory of knowledge. He interprets the concept along that of the law of nature and implicitly outlines a method for the evaluation of the credibility of miracles. All this sets the agenda for the contemporary analytical debate. Miracles are discussed within contemporary analytical philosophy to a considerable extent, sometimes under the appearance of a mere commentary to Hume.[52]

Let us revert to the debate over Islam and science. My guiding intuition regarding the concept of a 'miracle' proved rather fruitful. Indeed, the discussion of the Qur'anic concept of miracle and of supernatural narratives during the conversations acts as a prism that discloses and dissects each author's views not

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47 Cf. Monden 1960, 295 ff.

48 Bultmann 1984.

49 Cf. Tillich 1951, 115–118.

50 Such positions are nowadays discussed, against the background of the respective philosophies, as part of historical criticism. For historical surveys and systematic discussion of single contributions cf. Bron 1979, Burns 1981, Brown 1984, Brown 1995, Cox 2002; Nuyen 2002.

51 Quoted in Swinburne 1989, 27–28.

52 Cf. Fogelin 2003. Some philosophers have specialized in the topic and dedicated to it works of a certain extension, discussing preceding positions and developing original views. Such is the case of Richard Swinburne and A. H. Larmer. The former defines a miracle as 'an event of extraordinary kind, brought about by a god, and of religious significance' (Swinburne 1970, 1). According to the latter, a miracle is instead 'an unusual and religiously significant event beyond the power of nature to produce and caused by an agent which transcends nature' (Larmer 1988, 14).

only on miracles *per se*, but more generally about the definition of science and the interpretation of the Qur'an. Let us recapitulate and compare the different ideas encountered.

In the case of Yahya's message there seems to be no definite, analytical discussion of the term 'miracle' but rather an insistence of its usage in connection with the description of natural phenomena. Miraculous is deemed to be not only their beauty or perfection, but also the fact that the universe they compose is appropriate for life. The usage of the term 'miracle' is then deeply embedded in the rhetoric of theoscientography that I have previously identified, and obviously has its Qur'anic basis in the multiple meanings of the term *ayah*/sign. Yahya also uses the term in reference to supernatural events connected to the lives of the prophets, and in one case he extends its rhetorical employment to describe, ironically, the survival itself of the belief in Darwinism despite what he presents as the overwhelming evidence against it.[53]

El-Naggar fully accepts the idea of supernatural miracles described as an interruption of the laws of nature that cannot be explained by science. Qur'anic narratives reporting these kinds of events, following El-Naggar, have to be interpreted literally, not metaphorically. When asked whether at least an event like the parting of the Red Sea could be interpreted in physical terms, that is, as extraordinary and theologically significant but still physically explainable, the Egyptian geologist emphasizes its supernatural character. At the same time, El-Naggar denies that miracles can happen in our time and expresses diffidence towards 'miraculous healings' such as those reported in Sufi narratives. Interestingly enough, despite the explicit use of the term 'miracle' in his works,[54] the Egyptian geologist claims that he prefers the expression 'scientific precision' to that of 'scientific miracle' of the Qur'an (and the Sunna). However, terminological debates aside, it seems clear that the *function* absolved by both supernatural events proper and the supposed presence of scientific notions in the Qur'an is analogous: they are both extraordinary occurrences and can only be explained through divine intervention, which they in turn demonstrate (or at least significantly point at). The famous (or infamous, depending on the point of view) narrative of the splitting of the Moon as ascertained by American astronauts represents an interesting, if disputable, argument that further enlightens the way in which science and religious narratives are blended by El-Naggar: whereas science is said not to be able to explain miracles, its authority is invoked to validate the occurrence of a miracle in the past.

Golshani is more open towards the existence of miracles nowadays, and interprets them by recurring to a theory from Mutahhari: miracles are events governed by laws that the spectators of those very events do not know. Such laws might cancel out the effect of known laws to give an impression of the suspension of the latter; that is not a supernatural suspension, though, but a natural one according to principles unknown to those who witness them. Yet Golshani is also open to a metaphorical interpretation of the Qur'anic verses reporting seemingly supernatural narratives. Similar principles hold for Altaie,

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[53] Harun Yahya, *Atlas of Creation* 1, 732.

[54] Cf. for instance El-Naggar 2008, 11.

who also drives attention to the fact that the boundaries between what is described as 'ordinary' and as 'extraordinary' are redefined if one looks at the world through the eyes of a physicist, that is, aware of the fact that some extraordinary and counterintuitive events can be explained in the light of the laws of physics. Altaie places the emphasis on the extraordinary rather than on the supernatural; however, he does not exclude a metaphorical interpretation of supernatural narratives either. Of course the logico-philosophical reliability of these explanations can be further debated. What seems to be most interesting from a cultural point of view is that, in Golshani's and Altaie's respective definitions, miracles are accepted (i.e. a non-metaphorical interpretation thereof) without making them collide with science and nature. Miracles might appear supernatural to some observers, but they obey some laws and are therefore explainable (at least in principle). Such definition is in harmony with post-Humean parlance (albeit not in line with Hume's doctrine proper), that is, with definitions of 'miracle' in the Western/Christian debate, and might prove much more palatable to a scientifically well-informed reader than El-Naggar's definition.

Guiderdoni sketches a nuanced classification of miracles: he points out that the miracle *par excellence*, according to the traditional doctrine, is the Qur'anic revelation; miracles in a second sense can be extraordinary coincidences, religiously significant but fully explainable in physical terms; finally, miracles can be supernatural narratives, such as the splitting of the Moon. In this last case, Guiderdoni is more inclined to embrace a spiritual, that is to say, metaphorical interpretation. Guiderdoni points out the amazing fact that the laws of nature are constantly at work, yet at the same time he does not rule out the possibility of the supernatural proper. One feature of miracles he is particularly eager to emphasize is their *uniqueness*, which places them outside the possibility of being verified or ascertained by scientific methods. Guiderdoni's interpretation draws upon the multiple meanings of 'miracle' evoked in the Qur'an without simply combining them, and it also leaves space for present-day miraculous occurrences.

Also, Guessoum presents a multi-layered interpretation. The Algerian physicist does not regard Golshani's theory as unsound (i.e. logically flawed), but he points out that the events described by such an interpretation cannot legitimately bear the label 'supernatural' anymore. The existence of unknown laws, Guessoum observes, is constantly accepted as a possibility in the scientists' mind-set and practice: whenever they stumble upon an anomalous event they look for an explanation without automatically labelling such event 'miraculous' or 'supernatural'. We can add that, conversely, miracles are not just anomalous events but they also bear religious significance. For instance, when the German chemist Friedrich Wöhler (1800–1882) synthesized urea in his laboratory (1828), thus obtaining (contrarily to the physicists' conviction until that moment), an organic compound from inorganic ones, he did not regard such occurrence as supernatural, divinely induced or religiously significant.[55] On the contrary, as Wöhler's very episode seemingly demonstrates, natural scientists do look for anomalies that run contrary to received views while setting up their own

[55] Cf. Wöhler 1828.

experiments. Guessoum also regards Altaie's specific association of miracles with the effects studied in quantum physics as somewhat far-fetched: not being a phenomenon on the atomic scale, Moses' staff turning into a snake cannot be explainable in quantum terms. Furthermore, 'supernatural' conveyed as the suspension of the laws of nature is rejected by Guessoum, according to what we might call an Averroesian argument; in other words, admitting the possibility of a suspension or disruption *tout court* of the laws of nature is considered by Guessoum tantamount to denying the sense itself of scientific investigation. However, in a similar Averroesian vein, as we have also recalled while discussing his criticism of Bucailleism, Guessoum also maintains that there are different levels of interpretation/revelation the Qur'an adapted for the different intellectual needs of different audiences. In this sense, even a literal, 'supernaturalistic' reading of the splitting of the Moon (and of similar episodes) might be acceptably useful for a scientifically illiterate audience – even if Guessoum is not inclined to recommend the permanence in a state of scientific illiteracy (if not as an individual then on a social scale). Finally, Guessoum is rather inclined to maintain the expression 'miracle', or 'miraculous' for extraordinary events and, in a Muslim context, first and foremost for the Qur'an's inexhaustible openness to new interpretations (once again in harmony with the idea of different levels of interpretation that prove satisfying for different readerships, diachronically and synchronically).

It should also be noted that Guessoum, Guiderdoni, Altaie and Golshani all seem predisposed to accept that the Qur'an might contain obscure parts. Of course, the acceptance of this exegetical principle acts as a 'universal pass' to avoid any possible conflict with science; much more complicated in this sense is El-Naggar's position, since he seems to deny the presence of any unexplainable passages at all. Notwithstanding the significant differences in their respective positions (and, correspondingly, in the targeted audiences) all of my interlocutors interpret miracles in a way that harmonizes religious and scientific beliefs, and that is linked to a specific meaning of 'miracle' detectable in the Qur'an – a *wondrous* fact or phenomenon indicative of God's existence and power.

4. How to Become Fully New (and Still Islamic): A Sketch of a Proposal on the Footprints of Latour

Let me try to outline a general lesson from all the observations conducted thus far. If one considers communicative and argumentative strategies, recurring themes, ongoing discussions, as well as those issues that are still in need of further investigation and assessment on part of external observers, the definition and identification of a 'new generation' appears rather simplistic. It is perhaps more enlightening to talk about local conceptual shifts that, considered as a whole, give the impression of a change that, in its turn, cannot be reduced to a definition or a formula. Taking into consideration such an analysis, I have come to consider my own discussion of a 'new generation' as a didactic fiction. In other words, I regard it as useful to shed light on the fact that there is an on-going effort, individually carried out by different scholars, to reconsider the relationship of Islam and science on multiple and variously interrelated levels which are different

from Traditionalism, from Bucailleism strictly meant as the systematic and exclusive identification of 'scientific' notions in the Qur'an, and from the Islamization of knowledge/science *à la* al-Faruqi.

One of the main trends in the discussion of science and religion is the elaboration of models for their interaction. We can here remember at least the pivotal model invented by Ian G. Barbour (b. 1923) that includes four main types of relationships:[56] conflict (when science and religion make competing claims about the same domain); independence (when they coexist without overlapping); dialogue (when they explore methodological commonalities); and integration (when science and religion cooperate in mutually correcting some of their claims). It can be asked whether the authors who advocate the harmony of Islam and science fit into this kind of taxonomy. However, the ongoing character of the debate, as well as the multi-dimensionality of the discussion of single topics, seem to offer strong resistance to this kind of reduction; perhaps it is more cautious to study how different thinkers adopt such attitudes to specific topics.[57]

A staunch opponent of the attempts at mapping the relationship between religion and science is B. Latour. Latour expresses his dissent with a telling comparison. In his words, the advocates of such models '[...] speak like Camp David diplomats drawing lines on maps of the Israeli and Palestinian territories. They try to settle disputes as if there was one single domain, or – following the terrifying similarity with the Holy Land – as if two equally valid claims had to be established side by side'.[58] Other telling images that Latour employs to describe the debate on science and religion taught in such terms are 'a comedy of errors', or a race between the rabbit and the tortoise.[59] Latour does not want either to claim that religion is some form of 'necessary irrationality', reducing it to a form of nonsensical, irrational, subjective although possibly beautiful expression.[60] Therefore, Latour's position is respectful of religiosity even if it might not be in harmony with the way in which religious folk conceptualize their own beliefs. He also claims that, 'there is no point of contact between the two', although even the thesis of their '[...] incommensurability would be a category mistake'.[61]

In order to understand his position about religious statements, we have to consider what Latour says about another kind of statement, which we are probably familiar with: lovers' speech. When a lover asks his partner to repeat whether she loves him, Latour points out, it is not as if he '[...] simply pushes the play-button of a tape recorder in order to prove that, five years ago, she had indeed said "I love you darling" [...]'.[62] This because love-talk is not subject to verification or, in Latour's phraseology, 'double-click questions'.[63] Love-talk,

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[56] Barbour 2000.

[57] I have explored in some detail Barbour's model *vis-à-vis* Nasr, al-Faruqi, Golshani and Guessoum in Bigliardi 2012.

[58] Latour 2010, 109.

[59] Latour 2010, 110–111.

[60] Latour 2010, 109.

[61] Latour 2010, 110.

[62] Latour 2010, 108–109

[63] Latour 2010, 106.

Latour emphasizes, is one of those forms of speech to which we are accustomed and 'that are evaluated not by their correspondence with any state of affairs, but the quality of interaction they generate in the way they are uttered'.[64] The sentences belonging to love-talk, Latour points out, need not be original nor are they informative; they are trans-formative, they induce a 'displacement' in the listener as well as in the speaker.[65] This change, according to Latour, has to do with proximity in space and time: the change consists of literally '[...] re-present[ing] anew what it is to be present at what one says'.[66] Latour emphasizes as well that '[...] this form of talk is at once completely common, extremely complex, and not that frequently described in detail'. [67]

Latour contrasts love-talk with scientific talk, concerned with verification. However, contrary to what many might think, verification, in Latour's interpretation, has nothing to do with proximity or immediacy: he points out, '[...] it builds extraordinarily long, complicated, mediated, indirect, and sophisticated paths so as to reach the worlds [...] that are invisible because they are too small, too far, too powerful, too big, too odd, too surprising, too counterintuitive, through concatenations of layered instruments, calculations, and models'.[68] Therefore, although science is, more properly than love-talk, subject to double-click verification, such verification has nothing to do with the representation of the close and present and leads rather to the 'distant' and 'absent'.[69] Hence, in Latour's interpretation, science is usually associated with a kind of objectivity, the objectivity of what is near and familiar that is in this case a misled and misleading notion.

Religious talk is compared by Latour to love-talk. It is, in his interpretation, a kind of transformative talk that wants to redirect the listener's attention to what is near. Not only it is not subject to double-click verification, it precisely wants '[...] to divert it, to break it, to subvert it, to render it impossible'.[70] In Latour's interpretation, religious tales cannot be analysed or reduced to verification; religious tales can just be repeated, '[...] utter[ing] again a word that produces in the listener the same effect, namely the one that impregnates with the gift of the renewed presence' (Latour's example is Gabriel's salutation to Mary), whereas the requests for the verification of those very tales '[...] want you to abandon the present time and direct your attention away from the meaning of the venerable story'.[71] Religion, and not science, in Latour's paradoxical interpretation, '[...] should be qualified as being local, objective, visible, mundane, un-miraculous, repetitive, obstinate, and sturdy'. [72]

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[64] Latour 2010, 102.

[65] Latour 2010, 102.

[66] Latour 2010, 104.

[67] Latour 2010, 104.

[68] Latour 2010, 111.

[69] Latour 2010, 113.

[70] Latour 2010, 106.

[71] Latour 2010, 106–107.

[72] Latour 2010, 111.

After the reconstruction of Latour's ideas that I have just outlined, it should now be clearer to my reader why he so emphatically rejects the debate about science and religion insofar as it is taught in traditional terms. First, if we follow Latour, we see that science and religion are usually understood in the light of notions of objectivity and verification, which are not those they really deal with. Given the deep differences (as well as the unsuspected commonalities) that we have just seen, none of the two tolerates an analytical attitude. On the one hand, if one tries to isolate a religious tale and asks about its referential value, the 'venerable story' is turned into a lie '[...] because I have distorted it beyond recognition', 'I [...] transmogrify it into an absurd belief, into the sort of belief that weighs religion down and lets it slide towards the refuse heap of past obscurantism'.[73] On the other hand, since scientific talk *does* have a reference but not by way of a mimetic correspondence, '[i]solated, a scientific image has no truth value, although it might trigger – in the mythical philosophy of science that predominates – a sort of shadow referent [...] [that is] the virtual image of an isolated copy [...]'.[74] In other words, according to Latour, both science and religion have a *flowing* character.[75]

I formulate here a hypothesis: all of the authors here considered, including the Bucailleists, seem to subscribe, predominantly and tacitly, to the kind of objectivism criticized by Latour. Religion (or revelation) and science, in their view, never clash and this point is defended according to different strategies and with different divergences, but still, while articulating such an idea religion and science are more or less implicitly conceived as *territories* or geometrical *planes* that sometimes harmoniously overlap, for instance talking about the same *objective entities* (natural phenomena), and sometimes just remain separated like good neighbours. Therefore, debating over Islam and science constantly results in a sort of tightrope walk.[76] In other words the kind of objectivism and 'geographical talk' criticized by Latour seem to be pervasive in the whole debate over Islam and science, and even common to sophisticated and unsophisticated discussions of the relationship of the Qur'an and science. Most authors tend to implicitly embrace the idea that some Qur'anic passages can be, to use Latour's words, double-clicked, and also that science is concerned with phenomena denoted as what is 'near' and 'solid' – in the senses criticized by Latour. In this way, the debate apparently rages over *how* the revelation should be double-clicked, or *who* should best do so, but not over the very appropriateness of double-clicking. This kind of implicit setting, in my view, is *pervasive* and *predominant*, but not *exclusive*. Indeed, we also see that the Qur'an and science are occasionally described as in harmony while emphasizing that the former *invites* the pursuit of the latter. This idea might be emphasized while completely abandoning the talk of boundaries and phenomena as tangible facts, in favour of a bold Latourian approach. Or, conversely, the seminal Latourian elements of the discussion should be brought to maturation.

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[73] Latour 2010, 107.

[74] Latour 2010, 114.

[75] Latour 2010, 121–123.

[76] I borrow this expression from Hameed 2012.

I have previously mentioned the potential mismatch between an interpretation of religion in Latour's terms and the way in which religious people commonly understand their own religious beliefs and practices. It is still open to investigation and discussion whether and how an approach *à la* Latour can be consistently and convincingly applied to a *religious* understanding of religion. Attempts at applying Latour's philosophy to Christian theology are nascent, if promising.[77] To my knowledge, a systematic attempt at reading Islamic theological concepts according to such an outlook has yet not been attempted, even if we should not forget that Latour's earlier works inspired Sardar and the *Ijimalis*.[78] However, the proposal that I am advancing is that a Latourian approach has all the potential to project the whole discussion of Islam and science on a completely different level, by-passing never-ending discussions about the degree of literalism to be adopted in interpreting the Qur'an, as well as infinite hair-splitting regarding the 'boundaries' of science and religion, and that such an outlook has the advantage of being in harmony with the suggestion that the Qur'an is a book of *guidance*, that encourages us to embrace science as a *practice*. Instead of trying to draw subtle lines between 'scientific exegesis' and 'scientific miracles', or distinguishing between degrees and areas of competence, one could namely redefine the very notion of the 'natural facts' studied by science and point out that the Qur'an invites the pursuit of science as the dynamic enterprise described by Latour.

Latourian ideas undoubtedly represent a highly sophisticated position, and complexity is always difficult to communicate and to manage. It is reasonable to expect that, in their respective roles as teachers and public intellectuals, figures such as Golshani, Altaie, Guiderdoni and Guessoum, will continue contrasting rampant pseudo-science with 'localized interventions' to refute specific pseudo-scientific notions, and to communicate the method and object of science in a relatively simple way to a general public. Similarly, it is to be expected that different scholars will keep competing both with popular, oversimplified accounts of history, as well as among themselves with different historical narratives. Analogous observations hold for the debate regarding biological evolution. But perhaps, on a more sophisticated and philosophical level, the decisive leap from an 'old' to a 'new' generation in the debate over Islam and science will *not* be marked by a thinker who will convincingly work out an interpretation for each and every sensitive topic such as evolution, miracles and divine intervention in terms of rules regarding the respect of boundaries, but rather by a thinker who will have the courage to entirely and consistently subscribe to a non-objectivist conception of religion and science, and reformulate the whole discussion in such terms.

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[77] An interesting attempt is Miller 2013.

[78] Cf. Sardar 1989, 140–144.

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Glossary

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Abbasid: The name of the second Muslim dynasty, after the Umayyad dynasty (661–750), which ruled from 750 until 1258 CE. Supposedly, Abbasids were descendants of al-Abbas, an uncle of Prophet Muhammad. They brought an era of strong government, economic prosperity and a flourishing civilization, but with the Mongol invasion of 1258, the dynasty was swept away.

***'Adl (al-'Adil)*:** Literally, justice. Appointing what is just, equalizing, equal measures. In Islamic theology, *'adl* refers to God's divine justice. *Al-'Adil* is one among the 99 special names of God and signifies 'the Just'.

Al-Azhar: The most famous university of the Sunni Muslim world in Cairo (Egypt), founded in 358 A.H./ 969 CE, giving an important impetus to the development of education. Al-Azhar has acquired great prestige and a reputation for authority in religious domains that it has to some extent kept to the present day. It is today still one of the principal centres of Arabic literature and Islamic learning and is the oldest degree-granting university in Egypt.

***Asharite*:** The Ashari School is an important school of theology in Sunni Islam. It is named after Abu al-Hasan al-Ashari (873–935), who sought to define and defend doctrines about God, the Qur'an and free will in terms of rational philosophy. Asharite thinkers, following al-Mu'tazila, dealt with the main theological issues of Islamic faith, including arguments for the existence of God, divine unity, revelation, prophecy and eschatology. They aimed to refute the opposing views of other religions and philosophical schools in a rational dialectical method. The Ashari School grew in Basra and Baghdad, drawing its inspiration from al-Ashari's theology and method of rational argumentation. By the late twelfth century, it had become the dominant Sunni theological tradition. For centuries, the Ashari School gave a rational impetus to Sunni faith in opposition to speculative philosophy and Shi'a-doctrines.

***Ayatollah*:** (Arabic, *Ayat Allah*: 'a sign of God'; a miraculous sign, a mark, an exemplar of God). Ayatollah is an honorific religious title for high-ranking Shi'ite religious authorities. It denotes a religious scholar of outstanding authority and reputation, and a specialist in law.

***Awqaf* (*Waqf*):** Literally, 'standing', 'stopping', hence a 'perpetuity' (pl. *awqaf*). It means the donation of property for charitable causes or giving of property by will or by gift in perpetuity to the Islamic state for pious works or for the public

good. It also means the religious endowments in conformity with the *Shari'a*, which produce revenues in support of charity or good purposes such as mosques, schools, orphanages and hospitals.

Caliph/Caliphate: (Arabic: *Khalifa*, 'deputy', 'vicegerent'). Caliph is the title of the ruler of the Muslim community after the demise of Muhammad in 632 CE. Another title given to the caliph later in history was 'commander of the faithful' (*amir al-muminin*). The term *khalifa* – which is used in the Qur'an with reference to Adam (2:30) and David (38:26) – is understood in Sunni juristic theory as the successor of the prophet Muhammad. The Arabic term *khilafa*, 'caliphate', denotes the political leadership of the Muslim community. The first four caliphs, known as Rightly-guided Caliphs, were: Abu Bakr (632–634), 'Umar ibn al-Khattab (r. 634–644), 'Uthman ibn 'Affan (r. 644–656) and 'Ali ibn Abi Talib (r. 656–661), and it ended with the latter's assassination and the rise of the Umayyad dynasty (r. 661–750).

Fatwa: A legal opinion issued by an Islamic legal scholar (*mufti*) in response to a question posed by an individual or a court of law. It is the opinion of a jurist on a point of law or legal problem. *Fatwa* covers a wider scope, including matters of legal theory, theology, philosophy and creeds which are not included in *fiqh* studies and there are three different concepts associated with the term: management of information about the religion of Islam in general, providing consultation to courts of law and interpretation of law.

Fiqh: Literally 'understanding', 'knowledge', or 'intelligence'; a technical term for 'jurisprudence', the science of Muslim law, which covers all aspects of religious, political and social life. *Fiqh*, in other words, is the study and interpretation of the sacred sources and covers all aspects of public and private life as well as business. It is the result of human reason and, technically, does not have the same status in comparison with *shari'a*, which is understood as divine law.

Hadith: (pl. *ahadith*): Literally 'speech', 'report', 'account'. Specifically, it means traditions relating to the deeds and utterances of Muhammad as recounted by his companions. The *hadith* is the basis, second only to the Qur'an, of Islamic law.

Hajj: The canonical pilgrimage to Makka and Medina, and one of the five pillars of Islam, which a Muslim is required to make at least once in his/her lifetime, if he or she can afford it and is physically able (Q 3:97).

Halal: Literally 'released' (from prohibition), 'permissible' or 'lawful'. It denotes that which is lawful or permitted, or allowed. The term, in Muslim practice, generally refers to that which is proper and therefore permitted for use. More specifically, in Islamic legal discourse, it is usually applied to rules pertaining to consumption of food and drink, or related issues, where it is contrasted with notions of *haram*, 'the forbidden'.

Haram: Literally 'forbidden', for what is understood as revealed, i.e., sacred reasons. It means that which is prohibited or illegal in Islamic law.

Hijab: Literally 'veil', 'partition'. Derived from the root *h-j-b, hijab* means (among others) cover, wrap, curtain, veil and partition. In Islamic terminology, it refers to the head, face or body covering worn by Muslim women.

'Ibada: (pl. *'ibadat*). Derived from the verb *'abada*, 'to serve', and *'abd*, 'slave' or 'servitor', it refers to the service, servitude and by extension the very notion of religious worship, or all acts of worship or ritual.

I'jaz: Literally, 'invalidation' or 'prevention' of any attempt at a challenge, but it generally refers to the 'inimitability' and 'incomparability' of the Qur'an – a belief that no human speech can match the Qur'an in its content and form. According to this doctrine, the Qur'an is a miracle and therefore it is the proof granted to Muhammad in his capacity as a prophet in the authentication of his prophetic status. The concept of inimitability originates in the Qur'an, where in five different verses there are challenges to opponents to produce something like the Qur'an: 2:23, 10:38, 11:13, 17:88 and 52:34.

Ijma': Literally 'assembly'. *Ijma* is a consensus (of scholars), expressed or tacit, on a question of law. It is one of the principles of Islamic law, based on the *hadith* (Prophetic saying), 'my community shall never be in agreement in error'. Along with Qur'an and *hadith*, it legitimizes the law.

Ijtihad: Literally 'effort'; in general usage, it means the utmost effort, physical or mental, expended in a particular activity. In its technical and legal connotations, it denotes the thorough exertion of a jurist's mental faculty in finding out a solution to a legal question. In later history it has also acquired the meaning of re-interpretation of Islam.

'Ilm: Commonly translated as both 'knowledge' and 'learning', because it refers both to the process of attaining knowledge and to the information that one gains by learning. It means cognition and its acquisition, and is connected with various Arabic terms like *ma'rifa* (gnosis or knowledge acquired through reflection or experience), *fiqh* (understanding), *hikma* (wisdom), and *shu'ur* (intellect/consciousness). *'Ilm* is the opposite of *jahl*, (ignorance). The concept of knowledge in Islamic theology is generally designated by two Arabic terms that have overlapping meanings but different connotations, *'ilm* and *ma'rifa*. *'Ilm* designates knowledge, the 'science or study of' a field such as the Qur'an, prophetic traditions (*hadith*), grammar, scholastic theology (*kalam*) and astronomy. It also denotes the knowledge of God in particular. *Ma'rifa* acquired two different meanings, secular knowledge on the one hand and knowledge acquired through an experience linked to the rituals of Sufism and to a knowledge that cannot be fully acquired by the individual, but has to be given by someone – a *shaykh* to a disciple. This latter sense was particularly characteristic of the language of *taṣawwuf* (Sufism).

Imam: Literally 'model', 'exemplar'. Imam (pl. *A'imma*) as used in the Qur'an means leader, foremost, symbol, model, ideal, exemplar, revelation, guide and archetype. Historically, the term means the religio-political leader of the Muslim

country, but it is interpreted and applied in different ways by Sunnis and Shi'as: for Sunnis, it means the leader of a prayer or the title of the head of the country or group. The founders of the schools of law, in particular, are called '*Imams*'. Among the Shi'ites, the word has a special significance of an intercessor, unique and predestined to the age. Almost the whole of their theology is founded on the ideas surrounding the term *imam*.

Iman: Literally 'faith' or 'belief'. Technically, it means faith in the religion of Islam and the person with the *Iman* being a Muslim. The Arabic word connotes security: one who believes becomes protected against untruth and misguidance in the world and against punishment in the next. The Qur'an says it is 'those who have believed' who shall enjoy 'security' (*Amn*) (Q 6:82 and 59:23). *Iman* in the sense of 'to become a believer' distinguishes a Muslim from a non-Muslim. *Iman* is also defined as faith in God, His angels, His Books (Revelations), His Prophets and the Day of Judgement (2:177). Muhammad said, 'Faith (*Iman*) is a confession with the tongue, verification with the heart and an act with the members'.

In sha-Allah: Literally 'if God wills'. The Qur'an 18: 24–25 says, 'and don't say regarding anything, I am going to do tomorrow; but only, "if God wills"'. These words are used to express the conditionality and dependence of human will upon God's will, and is used in all references to futurity and possibility in the future.

Istislah: Literally 'seeking what is correct, wholesome'. A principle linked to the jurist Malik ibn Anas, to the effect that public and individual good must be the criterion for the development of law. The basis of law is divine injection as found in the Qur'an and Sunna. These canonical sources, however, make implicit only the framework of Islamic law; the rest is elaborated by such guiding principles as *istislah*.

Jinn: (comparable to the English word 'genie') the inhabitants of the subtle and immaterial – or subtly material – world, the '*alam al-malakut*' into which the material and physical world is plunged, as if into a liquid. Some of the *jinns* are 'non-central' beings like the non-human creatures of this world, whilst others are 'central beings', like humans. *Jinns* with free will, endowed with intellect and capable of grasping reality are thus capable of being saved. The Qur'an says that the *jinns* were created of 'smokeless fire' (55:15). Moreover, Prophet Sulaiman (Solomon) is famed for his power to command the *jinns* (38:37–41).

Ka'ba: Literally, 'a cube'. The cube-like building, covered with black cloth, which stands in the centre of the Grand Mosque (*Masjid al-Haram*) in Makka, which contains the Black Stone (*Hajrul-Aswad*). The Ka'ba is also called the 'Holy House' (*al-Bayt al-Haram*) and the 'Ancient House' (*al-Bayt al-Atiq*). Ka'ba is the focus of the annual pilgrimage and the direction (*Qibla*) of the Muslims' daily prayers.

Kalam (***Mutakallimun***): Literally, 'speech' or 'dialect'. It refers to the field of theology, the study of divine speech, or *'Ilm al-Kalam* (Islamic scholastic

theology). It evolved as a defensive science in response to two needs: to justify Islamic beliefs and to provide a framework for justificatory reasoning. Theologians were called *Ahl al-Kalam* (the people of *Kalam*) or *Mutakallimun*.

Karama/Karamaat: Literally 'acts of generosity', or 'beneficence'. It refers to the gifts or powers of the spiritual or psychic nature acquired by a saint, a short version of miracles working. It also means 'spiritual attainment' or the wonders created by saints for the good of the people as well as proof of their sainthood.

Mahdi: (*al-Mahdi*) Literally, 'the directed one'; hence 'who is fit to direct others', a guide, leader. The term has come to denote a messianic figure whose presence will usher in an era of justice and true belief immediately before the end of time. Or a figure many Muslims believe will appear at the end of time to briefly restore righteousness over the span of a few years before the end of the world, the Day of Judgement. According to the Shi'as, Mahdi has already appeared in the person of Muḥammad Abu'l Qasim, the Twelfth Imam, who is believed to be concealed in some secret place until the day of his manifestation before the end of the world. The Twelfth Imam Shi'ites identify Mahdi with *al-Muntazar* ('the awaited'), who is 'the Hidden Imam'.

Makka (Mecca): A holy city in the Kingdom of Saudi Arabia, famous for the Ka'ba, the House of God. The Qur'an (2:196–198) requires every Muslim to perform the annual pilgrimage (*hajj*) at least once in a lifetime. Originally, Makka was called 'Bakka' (3:96). It has a number of other names, of which *Umm al-Qurra* (Mother of Cities) is most frequently used.

Messenger/Prophet: Prophets are regarded as virtuosos in divine-human communication. In Islamic terminology, there are two main terms for a prophet: (1) messenger (Arabic sing. *rasuol*, pl. *rusol*), the bringer of a message or revelation sent from God via angels (implying that the transmitter of the message is not the source and the revelation is not a human product, but divine speech; Q 16:2), and (2) prophet (Arabic sing. *nabi*, pl. *anbiya*) – a law-bringer who mediates a specific covenantal relationship with God and conveys the binding quality of divine law upon the community of believers. Prophets as law-bringers are sent by God to all people, conveying God's message in a language they can understand (Q 30:47). Islamic traditions accept the Qur'an's details, the ongoing covenantal legacy of Jewish and Christian prophets and revelations, including three chief scriptures: *Tawrat* (Torah), *Zabuor* (the Psalms) and *Injil* (Gospel).

Mufti: A legal functionary or religious scholar who is empowered to make decisions of general religious issues, called *Fatwa* (legal rulings). In practice, a *mufti* is often the senior official jurisprudent in a Muslim state. A *mufti* is therefore often a civil servant and there are state *muftis* ordered in hierarchies.

Mu'jizalt (Miracles): It refers to the supernatural powers given to prophets by God. There are at least four places in the Qur'an where Muslims believe that miracles are referred to: (1) the splitting of the Moon (54:1–2); (2) the assistance

given to Muslims at the Battle of Badr (3:120–1); (3) the celebrated night journey of the Prophet (17:1); and (4) the Qur'an itself (29:142).

Munafiq (pl. *munafiquon*): It denotes a religious hypocrite who outwardly practises Islam while inwardly concealing his disbelief (*kufr*), perhaps even unknowingly. The Qur'an has hundreds of verses discussing hypocrites, referring to them as more dangerous to Muslims than the non-Muslim enemies of Islam: for example 4:61, 140, 145; 8:49; 9: 64, 67; 63:1.

Mu'tazila/Mutazilites: Derived from the Arabic word *'a'tazala'* ('to take one's distance', 'to remove oneself', 'to withdraw'), *Mutazila* (literally 'the separatists') was a theological school of Islam that was renowned for holding reason (*'aql*) above scripture and other sources for its development of the method of dialectical theology. It was founded by Wasil ibn Atta (d. 748/9 CE), who separated himself from the school of Hassan al Basari (d. 728 CE).

Ramadan/Ramazan: the ninth month of the Islamic calendar, Ramadan (and one of the 'Pillars of Islam') is observed as a strict fast (*sawm*) from dawn to dusk of each day in the month (Q 2: 179–182). During this period, Muslims are supposed to abstain from food, drink and sexual relations, and the fast is used as a means of self-purification.

Salaf: (*Salaf al-Salih*): Literally, 'predecessors', 'ancestors' (or 'pious ancestors'). The first generations of Muslims, considered by later generations to be the most authoritative source for Islamic practices and guidance. The *Salaf* cover three generations: that of the *Sahaba* (the Companions of the Prophet), *Tabi'un* (the successors) who knew the Prophet's Companions, and that of the *Taba' at-Tabi'un* (the successors of the successors).

Salafiyya/Salafites: A neo-orthodox brand of Islamic reformism, originating in the late nineteenth century and centred in Egypt; its aim was to regenerate Islam by returning to the traditions represented by the pious forefathers – *al-salaf alsalih*. Salafism refers to a cluster of different Sunni reform movements and ideologies in contemporary Islam. The term is based on the Arabic word *salaf* or *al-salaf al-salih* (the righteous ancestors). Salafists: This 'salafi' approach rejects later traditions and schools of thought, calling for a return to the Qur'an and the *Sunna* as the authentic basis for Muslim life. The *salafi* approach emphasizes the application of *ijtihad* (independent reasoning) and rejects *taqlid* (lit. 'imitation' or 'blind following').

Sahaba: (Companions). Literally 'the associates' (singular, *sahabi*, 'an associate'). Strictly speaking, it means those followers of the Prophet who were closest to him in his lifetime, kept frequent company with him and strove to assimilate his teachings. The general opinion is that anyone who embraced Islam, saw the Prophet and accompanied him, even for a short time, is a *sahabi*.

Shahada: Derived from the verb *Shahida*, 'to observe', 'to witness', 'to testify', *Shahada* is one of the pillars of Islam, and means affirmation and testimony of

faith, *'La Ilaha illa Allah Muhammad Rasuol Allah'* ('there is no god but Allah, and Muhammad is His messenger'). This simple statement expresses a Muslim's full commitment to the teachings of Islam. Although the formula is not in the Qur'an, the phrase 'there is no god but Allah' can be found (Q 37:35; 47:19).

Shaykh/Shaikh: Literally 'old man', 'elder'. It denotes the title of the head of a village, or of a whole tribe, usually elected. It is also the title of one who has authority, whether spiritual or political, and in particular of a savant or a learned, or otherwise venerable, person. A special meaning of the word is that of a spiritual master, a preceptor, the head of a Sufi order, which in Arabic is also known as *murshid* ('guide') or a superior of an order of *Derveshes*. *Pir* is an equivalent term of *Shaykh* used in South Asia (India and Pakistan) and in Iran.

Shar'ia: Derived from the root *Shara'a,* having a primary range of meaning in relation to religion and religious law, *Shar'ia* refers to God's law in its quality as divine, indicating Islam, God's religion. It refers to God's law as it is with Him or with His Prophet, or as it is contained (potentially) within the corpus of Revelation. *Shar'ia* occurs once in the Qur'an (45: 18), where it is interpreted as designating a way or path, divinely appointed.

Shara'a: Literally to introduce, enact and prescribe. It refers to the canonical law of Islam as put forth in the Qur'an and the Sunna and elaborated by the analytical principles of four orthodox schools.

Shi'a/Shi'ite/Shi'ism: Literally, the 'factions', 'party', or 'followers', or supporters. Those who support the idea that Ali ibn Talib (the fourth Caliph) was the legitimate heir to Muhammad are called the Shi'as. They believe Ali and his descendants are the only legitimate caliphs. Shi'ism is a branch of Islam (comprising 10–15 per cent of the total of all Muslims) with doctrines significantly different from those of the orthodox Sunni majority. In other words, it is that branch of Islam that believes that the Prophet chose Ali and his descendants (*Ahl al-Bayt*) as the spiritual and political leaders of the Muslim community.

Sira: Derived from the verb *sara* (present *yasiru*), which means, 'conduct', 'behaviour', 'way of life', 'way of acting', 'life and times of…', 'vita' or 'to travel' or 'to be on a journey' and, last but not least, 'biography'. In Islamic terminology, *sira* means the study of the life of Muhammad. In the Qur'an, the word 'sira' occurs only once in 20:21, meaning 'conduct' or 'condition'.

Sufi/Sufism: The mystical traditions of Islam are known by the general term *Sufism*. The Arabic term on which the word *Sufism* is based is *tasawwuf*, and the individual who follows this brand of Islam is called a *Sufi*. Both terms are sometimes understood as derived from the Arabic word for wool (*suf*), unrefined material from which the garments worn by ascetics in the Middle East were made. Sufis, however, proposed other etymologies for the term, including the word *safa* 'to be or become pure' and *suffa*, in reference to the bench on which poor, pious members of Muhammad's community in Medina were accustomed

to sit when they gathered in his mosque. Sufis referred to themselves in other terms as well, such as *'abid* (slave, devotee), *zahid* (ascetic), dervish or *faqir* (impoverished ascetic), *'arif* (knower of spiritual truth), *salik* (spiritual traveller) and *'ashiq* (lover). They are also known as a *wali* or friend of God.

Sunna/Sunnite: In common usage, *Sunna* refers to the normative example of Muhammad, as recorded in traditions (*hadith*) about his speech, his actions, his acquiescence to the words and actions of others, and his personal characteristics. Sunnism/Sunnites refers to the majority community of the Muslims (comprising of 85–90 per cent worldwide), the others being Shi'ites. The term *sunnism/sunnites* is an abridgement of *ahl alsunna wa'al-jama* (the people of the prophetic tradition and community).

***Sura*:** Literally, 'a row'; (pl. *Surat*). A chapter of the Qur'an of which there are 114, or a designation used for the 114 independent units of the Qur'an, often translated as 'chapter'.

***Tafsir*:** Derived from verbal noun *fassara* ('to explain', 'elucidate'), *tafsir* designates explanation, interpretation, elucidation, exegesis and background information of the Qur'an.

***Tahriyf*:** Literally, 'distortion' or 'alteration'. An Arabic term used for the alterations that Muslims sometimes claim Jews and Christians have made to biblical manuscripts, specifically those that make up the *Tawrat* (Torah), *Zabur* (Psalms) and *Injil* (Gospel).

***Taqwa*:** the piety that comes from the awe of God, or God-consciousness, fear of Allah, piety.

***Tawhid*:** In the true sense of the term, it means the act of believing and affirming that God is One and Unique, in a word, Monotheism; or, the acknowledgement of the Unity of God, the Indivisible, Absolute, and the Sole Reality.

***'Ulama*:** Singular, *'Alim,* means 'one who knows', 'learned', 'a scholar', 'savant' or person of learning. More narrowly, the term is applied to those who are learned in Muslim theology, doctrine, law, etc., those who were recognized as scholars and authorities of the religious sciences or the body of learned persons competent to decide upon religious matters. Among the Twelfth Imam Shi'ites, the *'ulama* are the superior *Mullahs*, the *Mujtahids* whose leading members are called *Hojjatulislam* (*Hojjat al-Islam*) and Ayatollah (*Ayat–Allah*). Among Shi'as, the *'ulama* have a personal following and have the prerogative of making legal decisions (*Ijtihād*). Thus, they are a more direct and independent political force than the *'ulama* of the Sunnis.

Umma: *Umma* is an Arabic word meaning 'community' and in a modern context translated as 'nation'. It is commonly used to mean either the collective nation of states or in the context of Islam. The word *Umma* is used to mean the 'Community of the Believers' (*ummat al-mu'minin*), and thus the whole Muslim

world. *Umma* is in the Qur'an understood to refer to Muslims. The phrase *Umma Wahida* in the Qur'an (One Community) refers to the entire Islamic world as it existed at the time (Q 3:110).

Umayyads: (Arabic, *Al-Dulah al-Umawiyya*). The first Muslim dynasty, which ruled from 661– 750 C.E. Beginning with the reign of Muawiyya (r. 661–680 CE) and ending with that of Marwan II (r.744–50 CE.), the capital of the Umayyad dynasty was Damascus. It traces its name from a clan descended from Umayya of the Quraysh. Their rule was followed by the Abbasids.

Zakat/Zakat: One of the five pillars of Islam, *Zakat* (literally 'purification') means alms giving or the giving away of a portion of wealth to purify or legitimize what one retains. Or, it means the obligatory sharing of wealth with the poor and the community at the rate of 2.5 per cent of appropriated wealth above a certain minimum (*niṣab*). *Zakat* is an institution of Islam founded upon an express command in the Qur'an, 2:77.

Zindiyq: From the Persian *zand*, 'free interpretation', it means 'heresy', or a freethinker, atheist or heretic.

In sum, Muslims as well as believers in all religions have always grappled with how to religiously understand and explain developments in society. In more recent times, the many interpretations that exist regarding almost all issues in human life display a plurality of opinions on the 'true' meaning of Islam. *Islam and the Quest for Modern Science* is an excellent introduction to questions that, from a Muslim and confessional position, can be understood either as a challenge, a threat or a possibility. Muslim approaches, confessional or not, toward modern science are undoubtedly diverse, and how to Islamically understand modern science is a key topic at the core of today's discussion on the function of Islam. Therefore, this book is an important contribution that not only fills a gap in the study of Islam, but also portrays a discourse that touches upon fundamental questions in the production of Islamic theologies and the understanding of Islam among Muslims in general.

SWEDISH RESEARCH INSTITUTE IN ISTANBUL – TRANSACTIONS VOL. 21

ISTANBUL SVENSKA FORSKNINGSINSTITUTET

ISBN: 978-91-978813-2-6

Distributed by: eddy.se ab