

Religion and Science, Four Models, an Iranian Approach

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Introduction

Iran's revolution is understood (at least by its past leader, Ayatollah Khomeini) as the revitalization of religion in the modern world. Based on this religious foundation, Iranian governments in the past 40 years since the founding of the Islamic Republic in 1979 have had a special science policy, which (although with different accentuations) interestingly remained almost constant through the most fundamental political shifts. This paper, after a short introduction to the scientific achievements of post-revolutionary Iran, tries to look for religious reasons for this continuity in science policy.

The teachings of the Qur'an stress the importance of knowledge, and therefore it is of fundamental importance in Islamic culture to seek for knowledge. Yet there are different views concerning what is the proper relationship between science and Islam. This paper will define four different hermeneutic and philosophical approaches to the relationship between new sciences and Islam, focusing on post-revolutionary Iran.

Scientific achievements in post-revolution Iran

- A) Post-revolutionary Iran has witnessed significant progress in a number of scientific disciplines. Here five examples based on five different publications have been selected in illustration. Fereidoun Azizi in his paper 'Medical Education in the Islamic Republic of Iran' writes:

Medical education has undergone vast reform following the Islamic Revolution in the last three decades, with remarkable qualitative and quantitative progress having been achieved following the establishment of the Ministry of Health and Medical Education in 1985. There have been rises in the number of medical, dentistry and pharmacy schools from 7 to 36, 3 to 15 and 3 to 11, respectively, and in the numbers of student admissions in all programmes of medical sciences from 3630 to 6177

and teaching staff from 1573 to 13108, in the decades mentioned. The numbers of students in clinical subspecialty and PhD degrees have increased from zero to 268 and 350, respectively. (Azizi 2009)

B) Another area is nanotechnology. In a paper published in 01.2009, two professors from ‘Iran Nanotechnology Initiative Council (INIC)’ write that:

... During the last decade, nanotechnology has gained remarkable attention by international scientific and industrial societies. ... Islamic republic of Iran, also ..., initiated her national nanotechnology development plan referred to as "Future Strategy" in 2005. The strategic plan outlines countries major action plans for ten-year period up to 2015 with the target to be amongst the top 15 countries active in this very important area....

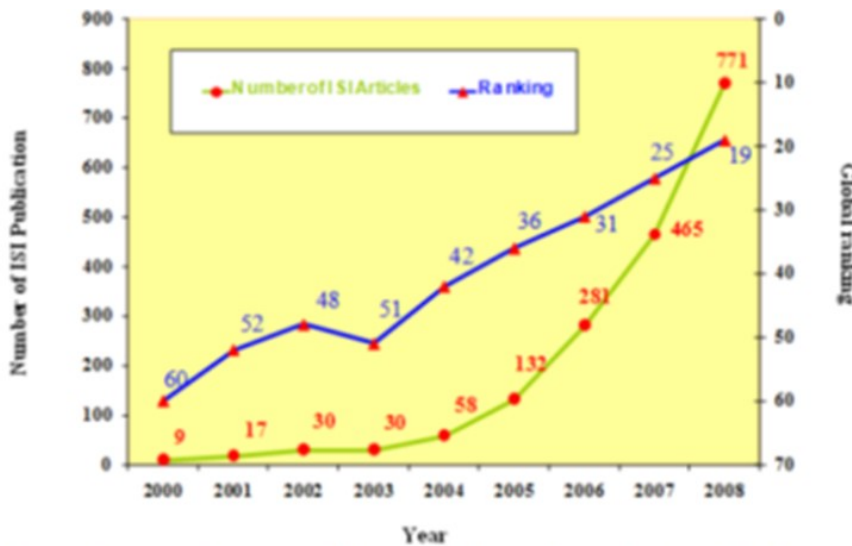


Fig. 1: The rate of increase in the number of ISI papers and Iran's global ranking in the field of nanotechnology

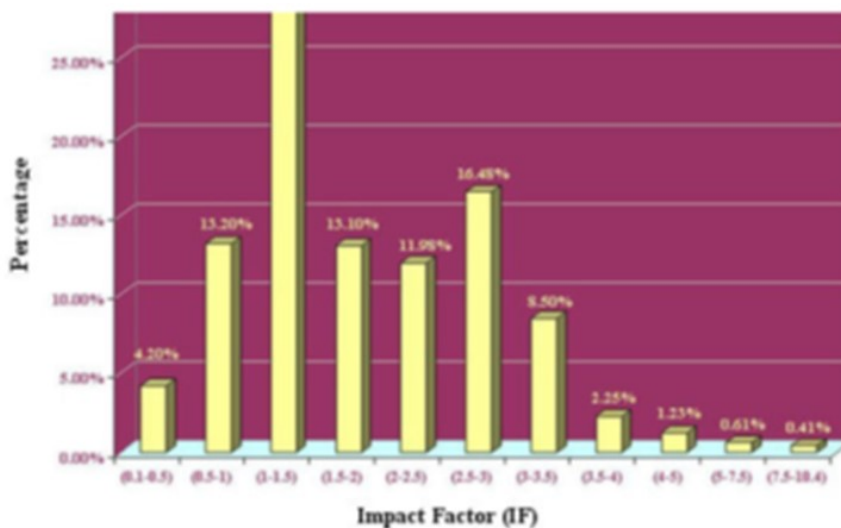


Fig. 2: The impact factor (IF) distribution profile of the nanotechnology related ISI papers published by Iranian scientists

Fig. 1 above displays the rate of increase in the number of ISI papers and Iran's global ranking in this field within the period of years 2000 to 2008. The growth in the quantity of the ISI papers may not fully describe the scientific achievements of Iran in this field. The quality of the published papers is normally implemented in the impact factor of the journals. However, this factor varies rather significantly for different areas of science and technology. Fig. 2 indicates the impact factor (IF) distribution profile of the nanotechnology related ISI papers published by Iranian scientists. (Sarkar und Beitollahi 2009)

- C) Another example is from the Stem Cell Research and Technology in Iran, especially in Royan Institute.

Figure 1 mirrors the progress of the Royan and its dramatic shift from a fertility clinic to a research center, as a sharp distinction between the first and the second phase is discernible. In the first phase, from 1991–1999, the total publications in scientific journals were two: one paper in 1998 followed by another one in 1999. However, in the second stage, the Royan Institute published 182 indexed papers out of which a total of 50 papers and reports were produced in 2009—a 50-fold increase in comparison to the initial year. (Miremadi 2010)

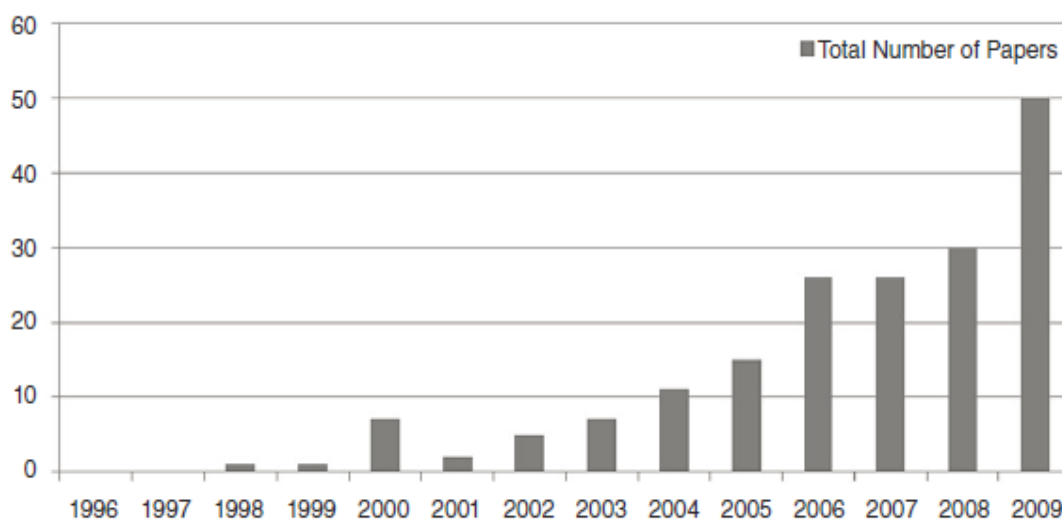


Figure 1. Annual Scientific Output

- D) An Investigation on the Scientific Publications: Iran, Turkey, and Greece' published in Journal of Paramedical Sciences (Spring 2010) compares the Scientific Products of Iran, Turkey, and Greece. The results have concluded that:

...Iran's scientific products during 2000-2008 show a growing trend... Turkey's scientific products during 2000-2008 show a growing trend like Iran's scientific products and so growth has been gradual with a similar tone....In the year 2000, we can see that Turkey had the highest amount of products (6595), while Iran had produced the lowest amount (1611); Greece, with 6338 products, shows just a little lower than Turkey. ...In 2008, Turkey with the highest amount of products (25654 documents) has been on the lead, while Greece had produced the fewest numbers (15682 documents). Iran has promoted its position, from the third rank to the second, by publishing a total of 15682 scholarly documents. We can say that during the years under study, Turkey has had the greatest number of products. Except in the year 2008, where Iran ranked the second, in other years Greece ranked the second. (Kazerani, Salahi Yekta und Nowzari 2010)

- E) The last example is about satellite technology. Professor Parviz Tarikhi in 'Iran's space program: Riding high for peace and pride' published in 'Space policy' (2009) shows that Iran belongs to one of the 9 countries all around the world that have launched their own satellite. He writes:

... USSR launched the world's first artificial satellite, Sputnik-1, in October 1957. The USA was next with the successful launch of Explorer-1 in January 1958. France, Japan, China, UK, India and Israel later developed and successfully flew their own space launchers. In the new Millennium Iran is the newcomer and first new spacefaring country since Israel joined the club in 1988 (see Table 3). (Tarikhi 2009)

Table 3
List of the countries that benefit from their own independent satellite launching and manufacturing capacities.

Country	Satellite	SLV	Launch Site	Date (UTC)	Continent
USSR/Russian Federation	Sputnik-1	Sputnik-PS	Baikonur, USSR	October 4, 1957	Euro-Asia
USA	Explorer-1	Juno 1	Cape Canaveral, USA	February 1, 1958	North America
France	Astérix	Diamant A	Hammaguir, Algeria	November 26, 1965	Europe
Japan	Ōsumi	Lambda-4S	Uchinoura, Japan	February 11, 1970	Asia
China	Dong Fang Hong 1	Long March-1	Jiuquan, China	April 24, 1970	Asia
UK	Prospero X-3	Black Arrow	Woomera, Australia	October 28, 1971	Europe
India	Rohini-1	SLV	Sriharikota, India	July 18, 1980	Asia
Israel	Ofeq-1	Shavit	Palmachim, Israel	September 19, 1988	Asia
Iran	Omid	Safir-2	Semnan, Iran	February 2, 2009	Asia

[Source: Author].

There are many other examples that display significant scientific achievements in post-revolutionary Iran. These achievements are a result of various factors that can include religious

inspiration to knowledge, and the necessity of promoting and defending a religious country in a non-religious world in which power relations are based on new sciences.

The religious motives of science policies, their supporting hermeneutical approaches to the original religious texts, and their practical consequences are the main themes which the following pages will examine.

The importance of knowledge in Islam

The Qur'an, as the most vital source for Islamic inspirations, invites all Muslims to seek for real knowledge. There are many verses in the Qur'an that illustrate different aspects of this theme. For example in chapter 35, verse 28, it says that: *'Among Allah's worshiper only those who have knowledge reverence him.'* For a Muslim, reverence for God is the core of being a Muslim and it can be seen that knowledge is mentioned as a presupposition or criterion for real reverence for Allah. In another verse we read: *'Allah exalts those who believe among you, and those who have given knowledge, to high ranks.'*¹ There is nothing more exciting and inviting for a dedicated Muslim than God's words that declare him to be exalted. This knowledge is seen as a heavenly gift and Allah exalts the ranks of those who have been given the knowledge. There are also many sayings from the Prophet Muḥammad that invite people to seek and gain knowledge:

Seek knowledge even in China! (Sadegh 1979); Seek knowledge, from cradle to grave! (Payandeh 2003); Seeking of knowledge is necessary for each Muslim men and women. (Al-Barghi 1952); The fish in the oceans and the wild animals in deserts say prayer for the seeker of knowledge. (Tabarsi 1965); Without doubt the angels spread their wings under the feet of those who seek knowledge! (Madjlesi 1983).

These sentences are part of the widespread prophecies of the Prophet Muḥammad that invite Muslims to constantly learn more, and the majority of Muslims know these words by heart. During the history of Islamic knowledge, some of these verses and words have been understood

¹ Quran: Ch.58, V.11.

as an obligation; it is exactly the same degree of obligation which obligatory prayers in Islam have. However, this quest for knowledge does not have a limit and people cannot be obliged to learn without limit. The question about what constitutes real knowledge or what the Qur'an means by knowledge or which knowledge must be sought in China or which knowledge is obligatory etc. became one of the most important discussions in Islamic culture².

In the early stages of Islam, the meaning of these words was almost clear: to seek knowledge was to understand the Qur'an and the words of the Prophet, and it was obligatory to actively learn the main teachings of Islam such as the absolute unity of God and the Islamic thoughts about the resurrection and Judgment Day. Towards the end of the first century of Islam and after the translation of Greek texts, Muslims were confronted with a flood of new ideas from philosophy, rhetoric, logic, astronomy, medicine and etc. which were not originally from the Prophet and therefore new³.

The words of the Prophet must therefore be reconsidered. Was his word that obligates the 'seeking of knowledge' restricted to the Qur'an and his sayings (*hadith*)? Or perhaps, did he mean universally all forms of knowledge? The mainstream of Islamic scholars decided on the second interpretation and tried to integrate all forms of knowledge in Islamic society. The main base and motive for this interpretation and struggle was the position of the intellect in Islam. As the Qur'an teaches, Muslims must return to their intellect because the Qur'an never contradicts the human intellect. The intellect is an inner prophet which reiterates the words of God⁴. A Muslim must accept the words of the Prophet Muḥammad because his thoughts are in accordance with this inner prophet. So if people from the other side of the world have used their intellect and have reached rational answers, these answers are part of the universal truth and 'the holy knowledge', which makes Muslims have more reverence to God.

² On different aspects of this see the following books: Turner, Howard R., *Science in Medieval Islam*, 1995; Hogendijk, Jon P and Sabra, Abdelhamid I., *The Enterprise of Science in Islam*, 2003; and Iqbal, Muzaffar, *Science and Islam*. 2007.

³ See for example: (Turner 1995) Chapter 2-4.

⁴ For example (Leif 1998), 37, 354 transmits a quotation from Prophet Muḥammad who has said: 'Intellect is the messenger of God'. To see the evolutions and developments of Islamic concept of intellect after Greek translation see: Davidson, Herbert A, *Alfarabi, Avicenna, and Averroes, on Intellect: Their Cosmologies, Theories of the Active Intellect, and Theories of Human Intellect*, 1992.

This mainstream, of course has had important antagonists. The most important group was (and perhaps are)⁵ those who believed that Islam *per se* is perfect and mingling it with any other idea reduces its heavenly capacity and makes it weak like any other human artifact. They tried (and try) to show the contradictions between Greek and Islamic thought, especially in philosophy and theology.

This challenge has been present in Islamic society throughout the Middle Ages, and over the time of the Crusades until the Renaissance and the Industrial Revolution at the beginning of the modern era. The prolonged humiliation of colonialism was the most important new chapter in this debate. Muslims were *practically* persuaded that they do not have enough power to protect themselves and the question was “Why?” It was clear that the new technology was based on a specific kind of knowledge and Muslims did not have this knowledge. However, the most important concern was not the question of “How can we get this technology?”, but rather, “Why have we not reached it ourselves? What was wrong with our knowledge that made us so weak and vulnerable?”

There were two widespread answers, as usual. While the first believed that the knowledge of Muslims was the root of their problem, the second thought that nothing is wrong with Islamic knowledge, but rather, Muslims’ way of life and thought was the origin of their weakness. For example, the Prophet instructed Muslims to be hard-working but they did not follow his command. It meant that the real knowledge lay in the Qur’an and the words of the Prophet, but Muslims have neglected to follow them. Contrary to this group, the first one believed that the Qur’an as a source of knowledge was too weak to be a perpetual inspiration for so many centuries. At the end of the 19th century and during the 20th century, Muslim reformers such as al-Afghani, Muhammad Iqbal, Muḥammad ‘Abduh, Ali Shari‘ati, Mahdi Bazargan, and many others dedicated their life to articulate their understanding of this particular question.

Iran, minted from Twelver Shī‘a tradition, was also under the same conditions, pained under colonialism and attacked by superpowers in the Second World War. The country was ruled by a dictatorial royal dynasty, the Pahlavis (1925–1979), and was also confronted with questions about the relationship between Islam and modernity. Iranian people were confused about the

⁵ The idea exists from the early centuries of Islam and each day finds its appropriate name from Ahl al-Hadith to The Hanbalis or Contemporary Salafis and similar other titles.

modern way of life and divided into Westernized citizens and radical traditional Muslims who were confronted with the question of real knowledge and the relationship between Islam and modernity. Especially during the 20th century, many Iranian reformers (like Ali Shari‘ti, Mahdi Bazargan, Abdolkarīm Soroush and others) have tried to answer this question and to open new horizons for Iranian society. Their answers have a long history but in view of the limitations of this paper, I will, instead of a historical account, suggest four universal approaches to this problem in Iranian society, which manifested themselves particularly clearly after the Islamic revolution in 1979. In this period, the governing ideas and answers to our question had an opportunity to fulfill themselves in government science policy and have resulted in practical achievements. On the other hand, due to the Islamic mottos and foundations of this revolution, all of these approaches were religiously inspired. In practical terms, because of the power structure based on the constitution, and because there is a majority of Muslims in Iran, it seems that there cannot be a science policy in post-revolutionary Iran which does not justify its roots through the Qur’an and the words of the Prophet.

The more important issue is the future role of Iran in a globalized world. As an international player, it is only through such analysis that one could reach a rational, realistic understanding of the way that Iran tries to present itself on the international stage. This paper tries to categorize different hermeneutic approaches to the main question (i.e. what is the relation between Islamic knowledge and the new sciences?) into four overall perspectives. These are the perspectives of (1) Technocrats, (2) Historicists, (3) Selectivists, and (4) Purists.

The four approaches

Technocrats

By Technocrats, I mean those who believe that new sciences are not discovered by Muslims but that this fact is not a hindrance, since the Prophet has instructed to ‘seek knowledge even in China’; evidently this science that Muslims must seek for in China would not be the interpretation of the Qur’an, but information that they do not yet have. As mentioned above, the basis of this understanding is the position of the intellect in Islamic thought. Since new sciences help human beings conquer the world with their knowledge and fulfill their wishes, it must be right and based on the truth. Religion is also nothing less than the ultimate truth. Therefore, Muslims are invited and obliged to seek knowledge; since seeking the truth is the

most important message of Islam, it is an obligation, like any other Islamic obligations, to be acquainted with new sciences and technologies. I named them Technocrats, because they believe that acquiring new sciences and technologies are part of a religious act, much like prayer or fasting. Furthermore, they also believe that the practice of each religious act is part of the truth, which is the overarching ultimate reality that stands behind everything and governs everyone: a non-personal omnipotent god. Technocrats believe that learning complicated sciences is part of a religious practice, where one must constantly be in search of the truth. For example, the Muslims must reach the highest level of knowledge about nuclear energy to discover the core of the smallest particles since it is part of the Prophet's command to 'seek knowledge even in China'. There is no difference between nuclear energy and how we reach salvation. Both are on the same level when they display the truth, and its discovery is a religious practice. Two important subgroups under this stream could be demonstrated, as follows.

The Qur'an as a scientific book

There are Technocrats who think that the Qur'an is a complete book that encompasses all forms of real knowledge, even though Muslims were historically not able to extract new sciences from it. There are many Islamic scholars, especially those who have a scientific academic background, who have tried and still try now to show that the Qur'an has spoken about electromagnetic waves, DNA, Newton's Laws of Motion, the speed of light, or the Big Bang theory etc.

In Iran, one of the most important representatives of this theory is 'the Liberation movements of Iran' which was one of the most successful political and social parties in the last years before revolution and in the first few years after it. Most of its founders who studied new sciences and wrote books on new sciences and the Qur'an are now extremely old or no longer alive. The founder of this party, Mehdi Bazargan,⁶ is a mechanical engineer who has written many books

⁶ Mansour Moaddel in 'Encyclopedia of the Modern Middle East and North Africa, by the Gale Group' writes about Bazargan the founder and leader of this party as follows: "Mehdi Bazargan (1907-1995) was born in Tehran. In 1931, he went to Paris to study engineering. Returning home in 1936, he taught at the college level. During the 1951 oil-nationalization movement, Bazargan worked with Prime Minister Mohammad Mossadegh and served as the director of the National Iranian Oil Company. After Mossadegh was deposed by the 1953 coup, Bazargan

on this theme. One of them, for example, covers the topic of entropy and other thermodynamic principals in the Qur'an. It is interesting to know that Bazargan was appointed Prime Minister of Iran by Ayatollah Khomeini, after the Islamic revolution.

Another pioneer and prominent writer taking this approach is Professor Dr. Mehdi Golshani. He is a professor of Physics at Sharif University of Technology, Tehran, Iran, and a winner of the John Templeton Award of the Science-Religion Course Program. Furthermore, he was also the judge of the John Templeton Award for Progress in Religion (the World's largest monetary award), 2000-2002. His publications include works such as: *The Holy Qur'an and the Science of Nature* (1998), *From Physics to Metaphysics* (1998), *Can Science Dispense with Religion?* (ed. 2004), and *Issues in Islam and Science* (2004).

The Qur'an as a scientific book

There are other Technocrats who have opposite beliefs. These Technocrats believe that the Qur'an, as a religious book, should not be regarded as the origin of all sciences and knowledge and that when someone tries to use it as such, he or she will only produce misunderstandings and misinterpretations. As a religious holy book, the Qur'an teaches Muslims the proper relationship one must have with God and other human beings. However, living in this world, achieving one's aims and accomplishing one's wishes is something human that one can and must accomplish on one's own. On the other hand, new sciences are human achievements that, like any other form of knowledge, must be learned and used. Therefore, Technocrats believe that those who have tried to show that the Qur'an encompasses all forms of knowledge are wrong and the falsehood of their claim shows itself in their methods. According to this understanding, Muslims have waited always for scientists to discover something in Physics for

resumed teaching. In the early 1960s, with the help of Ayatollah Mahmud Taleqani, Bazargan founded the Freedom Movement (Nehzat-e Azadi), which played an important role in the Iranian Revolution of 1979. After the revolution, Bazargan became the premier of the provisional government. With its fall, Bazargan lost much of his political influence but was elected, with a huge margin, as Tehran's representative to the parliament of the new Islamic Republic of Iran in the 1980 election. Throughout his career, Bazargan was a leading advocate of democracy. He also was a prolific writer, publishing more than twenty books and articles." (Moaddel 2006)

example, or Biology, and then they have proved that it was written in the Qur'an as well; but unfortunately, Muslims did not understand it before from their holy book.

One of the most important representatives of this approach is Dr. Abdulkarim Soroush. He studied Analytical Chemistry in graduate school in London, followed by History and Philosophy of science in Chelsea College. After the revolution, he returned to Iran and published many books, one being *Knowledge and Value* (1980) which claims that the right way of life cannot logically be extracted from our right knowledge about the world. It is interesting that a year after the revolution, all universities in Iran were shut down, and a new body was formed by the name of the Cultural Revolution Council, comprising of seven members, including Abdulkarim Soroush, all of whom were appointed directly by Ayatollah Khomeini. The purpose of this institute was to bring about the re-opening of the universities and the total restructuring of the syllabi.⁷

In recent years, Soroush has claimed that the Qur'an is sometimes scientifically wrong. He has been teaching for many years in Western universities as a visiting professor in Harvard, Yale, the University of Chicago, and the Wissenschaftskolleg zu Berlin. One of his most important books is "*The Theory of Evolution of Religious Knowledge*" a massive work of over 600 pages.⁸ He himself introduces this book with following words (writing in the third person):

This is a collection of articles that had earlier appeared in the monthly journal "Kayhan-e Farhangi" and had caused much controversy even then. The book has gone through four impressions, twenty thousand copies being published. In this book he presents a detailed discussion on the subject of the evolution of religion, explaining that religious knowledge is distinct from religion itself - the former being one among many of the branches of human knowledge and in interaction and transaction with them so that if the other branches of knowledge are subject to

⁷ To have a better understanding of the social and political conditions in those days, it is perhaps helpful to say that another member of this council was Dr. Ali Shariatmadari. He was a professor of philosophy whose PhD, awarded in 1959 by the University of Tennessee, concerned the philosophy of education and curriculum planning. With the advent of the Islamic revolution in 1979, he was made Minister for Higher Education in Mehdi Bazargan's interim government. Subsequently, he was tasked, together with Mustafa Moin, Ahmad Ahmadi and Abdolkarim Soroush, with training and vetting professors, selecting students, and Islamizing universities and their curricula. (Samii 2004)

⁸ In Persian, 3rd ed. Tehran 1994.

change and transformation, one can expect religious knowledge also to go through transformations. Dr Soroush has also proposed the mechanism for this transformation, emphasizing that, in reality, it is the human beings' understanding of religion that constitutes religious knowledge. (Soroush 2012)

It is clear that both groups follow religious motivations in practical science policy because, whether the Qur'an is a scientific book or not, to seek for knowledge is the Prophetic command. A significant factor is that Technocrats believe that modern sciences come from abroad, and they usually have more open political relations with developed countries. Some of them could look upon the science from these countries as holy (because knowledge is considered holy even in China).

Historicists

The Historicists claim that modern sciences are the result of Europeans' confrontation with Muslims and Islamic sciences in the Middle Ages, so modern sciences and technologies are the logical continuity of Islamic sciences. They believe that Islam as such was and is correct, perfect and sufficient to help human beings in all aspects of life. It is not important if modern sciences originate from the Qur'an or not. What is more important is Islam's invitation to knowledge. To seek for knowledge was a permanent command of the Prophet and a quest that is originally Islamic.

They think that there are enough historical documents to show that Islamic scholars, after the first centuries of Islam, have founded the most dominant culture in history. A civilization that was strong in all branches of knowledge and technology, an absolute knowledge-based transcultural civilization, which in each country and culture helped its people to surpass all their boundaries and limits and support them to reach new, unknown horizons.

The main problem which resulted in the fall of Islamic civilization-was not Islam, but rather, the Muslims. Along the centuries, Muslims have forgotten Islamic laws and way of life and followed traditional, erroneous understandings of Islam. In fact, they lose their power because they forgot the Islamic way of life. They believe that Muslims will re-acquire their former supremacy when they return to the Islamic form of life, which evidently requires a continuous

search for knowledge. I name this group Historicists because they seek and long for the lost historical magnitude of the Islamic civilization.

In the books of such thinkers⁹, we read about parts of the magnificent Islamic civilization in Baghdad, Damascus, or Cordoba; followed by sections about improved Islamic surgery; clean hospitals and the translation of Arabic books in the Middle Ages into Latin; books in philosophy, pharmacy, astrology etc. They are proud of Avicenna, Al-Ghazali, Averroes, al-Khwārizmī and other Islamic scientists, and they invite Muslims to return to these lost flourishing days.

As an argument for their way of thinking, they explain that Islam is open to all sciences and all scientific achievements. They repeat that they were the first Islamic physicians who made postmortem surgery in Middle Ages possible, since Islam allowed it; and in modern days, it was Ayatollah Khomeini who first, as a religious leader, proclaimed that *Sex Reassignment Surgery* under special conditions was allowed. In practical science policy, this group tries to be completely open, to regain the lost historical days.

Selectivists

The main point of Selectivists, while sharing ideas with Historicists, is their claim about the root and origin of modern sciences and technologies. They believe that modern sciences are the logical continuum of Islamic sciences, but they originate from the humanistic turn of the Renaissance and Humanism. In their understanding, Humanism itself is a rational reaction against irrationality and a political, immoral dominance of Christianity in the Middle Ages. Modern sciences are thus natural answers to human intrinsic curiosity, which was limited through the dogmatic positions of the Catholic Church in the Middle Ages. The books and

⁹ See the works of Morteḍa Moṭṭahari, Muḥammad ‘Abduh, Muḥammadreḍa Ḥakimi and..., it is interesting to know that this approach finds always supporting quotations from different famous writers all around the world. For example the following words of Bertrand Russell in his book *The Scientific Outlook* are mentioned in one of such writings (Ḥeshmati 2013): “The Arabs were more experimental than the Greeks, especially in chemistry. They hoped to transmute base metals into gold, to discover the philosopher's stone, and to concoct the elixir of life. Partly on this account chemical investigations were viewed with favour. Throughout the Dark Ages it was mainly by the Arabs that the tradition of civilization was carried on, and it was largely from them that Christians such as Roger Bacon acquired whatever scientific knowledge the later Middle Ages possessed (Russell 1931).

speeches of Selectivists (the most prominent is Supreme leader of Iran, Ayatollah Khamenei)¹⁰ are full of references to inquisitions of different scientists such as Giordano Bruno, Galileo Galilei and others from all over Europe by the hands of the Dominicans and other inquisitors. Through this documentation, they try to show that the Renaissance and Humanism have something in common with Islam, against Christianity and the Dark Ages of its dominance.

I name them Selectivists because they believe that modern sciences are originally human, but that through history, Humanism turned against its ancestors and founders, who were mainly mild Christians or deists. It became increasingly radical and changed its own bases, supporting philosophies of atheism or anthropocentrism that cannot be accommodated with any kind of religion.

The Selectivists therefore believe that for a better future, Muslims must change their form of life, return to Islamic values, and be aware of supporting philosophies and the fundamental picture of the human being behind new sciences and technologies by being selective about them. It means they must import new practical sciences and technologies, but not modern Humanities. A practical example for Selectivists would be Islamic banking. New economics is based on lucre; the Qur'an criticizes lucre and defines it as a fight with God.¹¹ The Selectivists explain that Muslims must learn the principles and methods of new economics, but their banking must be free of lucre.

As mentioned above, in practical science policy, the Selectivists are interested in practical new sciences and technologies but not in Humanities. Therefore, for example, during the presidency of Dr. Mahmoud Ahmadinejad, a Selectivist, the number of students who earned a stipend from the Iranian Ministry of Science to study Humanities in countries abroad decreased, while the number of Ph.D. students who received such stipends for new sciences and technologies increased.¹²

¹⁰ After street demonstrations in Iran in summer 2008, Ayatollah Khamenei declared that Iranian Universities pay too much for western Humanities and that, this being a defective investment, we need our own humanities. See <http://www.youtube.com/watch?v=U7riYjGUqbg>.

¹¹ Qur'an 2:278-279: "O you who have faith! Be wary of Allah and abandon [all claims to] what remains of usury, should you be faithful. And if you do not, then be informed of a war from Allah and His apostle. And if you repent, then you will have your principal, neither harming others, nor suffering harm."

¹² In the eight years of the presidency of Muḥammad Khatami, about 12000 candidates received a stipend from Iranian government to study abroad, but in the eight years of the presidency of Maḥmud Ahmadinejad about 7000 candidates received such a stipend, see ('Alavī 2013). In the last year of Dr. Ahmadinejad's presidency the Iranian

Purists

The fourth category, the Purists, also believe that modern sciences are the result of the humanistic turn. However, they view Humanism in a very pessimistic way. They believe that Humanism is originally egocentric and is based on a distorted relationship with the world and with God. In this relationship, the world is nothing more than a barrel where humans extract their wishes and desires. To know their approach better we must mention that they believe real knowledge comes from God to human beings, and all other forms of human theoretical achievements (except for mathematics) are models. Thereafter new sciences and technologies too are not actually forms of knowledge, but models for conquering the world; they are mainly fine instruments (software), which human beings, according to their history, have developed to perfection in order to fulfill their will to power. The ideas of Purists could be summarized in the following points:

1. The so-called modern sciences are not a kind of knowledge, but human models.
2. The so-called modern sciences are based on analytical methods, but the truth has a holistic nature and can be understood with holistic approaches.
3. The so-called modern sciences are not part of the unchanged truth, but fluid instruments. Real knowledge is fixed and absolute and comes to human beings as intuition from God.
4. The so-called modern sciences are a fulfillment of the human will to power.
5. The so-called modern sciences have invented a new language which explains everything without God.

I named this group Purist, because they believe pure Islamic knowledge will make humans free, pure, and powerful. This is found in Ayatollah Khomeini's words in the first year of the Islamic revolution:

government supported about 450 Ph.D. candidates to study abroad, about 22 percent of them being in humanities. In previous periods this proportion was much greater (see (Moslemi Na'inī 2011)).

...they criticize us... when you examine the root of these critiques you see that they criticize us because we have said something against imperialism, because it is against their targets. It is the real reason for their critiques... This is our problem and our young people are bounded with such dependency to west. We must hand in hand overcome this disaster. Forget the west! I thought if it would be possible we should make a wall, like the wall of China, between east and west, between Islamic countries and the west, a wall from earth to heaven, to save our country from them, if we say that we do not want your new achievements and progresses is also more useful for us, I mean also those things that they give us as new achievements.
(Khomeini 2008, 365)

But Purists (according to their practical attitude) could also be divided into two mainstreams: the simple Purists and the complex ones. While the first group believes that there is no reason to learn modern sciences, the other group claims that learning new sciences and achieving new technologies is necessary for practical reasons. The simple Purist looks for pure holy knowledge. They sometimes refer to a story in the holy Qur'an (Chapter 27) about the Prophet Solomon. According to this story, Solomon, who knows the languages of all animals, rules over them and wishes to see all the birds:

(19) And he sought among the birds and said: How is it that I see not the hoopoe, or is he among the absent? (20) I verily will punish him with hard punishment or I verily will slay him, or he verily shall bring me a plain excuse. (21) But he was not long in coming, and he said: I have found out (a thing) that thou apprehendest not, and I come unto thee from Sheba with sure tidings. (22) Lo! I found a woman ruling over them, and she hath been given (abundance) of all things, and hers is a mighty throne. (23) I found her and her people worshipping the sun instead of Allah; and Satan maketh their works fairseeming unto them, and debarreth them from the way (of Truth), so that they go not aright; (24) So that they worship not Allah, Who bringeth forth the hidden in the heavens and the earth, and knoweth what ye hide and what ye proclaim, (25) Allah; there is no God save Him, the Lord of the tremendous Throne. (26) (Solomon) said: We shall see whether thou speakest truth or whether thou art of the liars. (27) Go with this my letter and throw it down unto them; then turn away and see what (answer) they return, (28) (The Queen of Sheba) said (when she received the letter): O chieftains! Lo! there hath been thrown unto

me a noble letter. (29) Lo! it is from Solomon, and lo! it is: In the name of Allah, the Beneficent, the Merciful; (30) Exalt not yourselves against me, but come unto me as those who surrender. (31) She said: O chieftains! Pronounce for me in my case. I decide no case till ye are present with me. (32) They said: We are lords of might and lords of great prowess, but it is for thee to command; so consider what thou wilt command. (33) She said: Lo! kings, when they enter a township, ruin it and make the honour of its people shame. Thus will they do. (34) But lo! I am going to send a present unto them, and to see with what (answer) the messengers return. (35) So when (the envoy) came unto Solomon, (the King) said: What! Would ye help me with wealth? But that which Allah hath given me is better than that which He hath given you. Nay it is ye (and not I) who exult in your gift. (36) Return unto them. We verily shall come unto them with hosts that they cannot resist, and we shall drive them out from thence with shame, and they will be abased. (37) He said: O chiefs! Which of you will bring me her throne before they come unto me, surrendering? (38) A stalwart of the jinn said: I will bring it thee before thou canst rise from thy place. Lo! I verily am strong and trusty for such work. (39) One with whom was knowledge of the Scripture said: I will bring it thee before thy gaze returneth unto thee. And when he saw it set in his presence, (Solomon) said: This is of the bounty of my Lord, that He may try me whether I give thanks or am ungrateful. Whosoever giveth thanks he only giveth thanks for (the good of) his own soul; and whosoever is ungrateful (is ungrateful only to his own soul's hurt). For lo! my Lord is Absolute in independence, Bountiful. (40) He said: Disguise her throne for her that we may see whether she will go aright or be of those not rightly guided.

According to this story, someone who has **part** of ‘the knowledge of the book’ brings the throne of the queen in less than a second. This story proves that ‘the knowledge of the book’ can help humans conquer the world and to achieve the same things that the modern world tries to achieve through new sciences and technologies. Simple Purists believe that humans do not need universities, or new sciences and technologies. As to science policy, humans must invest in traditional Islamic seminaries, but of course with an increasing emphasis on purified Islamic knowledge, which comes from the Qur’an and the words of Prophet Muḥammad. Simple Purists are a small minority and they have not made a great impact on the science policies of post-

revolutionary Iran. However, they are a party which is not prepared to give up its cause, and they continue to exist because of their interesting religious arguments.

The complex Purists on the other hand, believe that new sciences and technologies must necessarily be mastered. New sciences and technologies are indispensable, not because they are a part of the truth, or aspects of eternal true reality, or the real knowledge that the Prophet commanded us to learn, but because they are the new forms of power and Muslims need power to defend themselves. The new sciences are a detour of humanity. They are a fulfillment of the human's will to power, but now they help reshaping the power structure in the world. They are not considered knowledge, but a type of manmade instrument (software) which have become like hardware because they are now needed for humans to survive and strive forwards. They usually emphasize this verse of the Qur'an (8:60) which says:

Prepare any strength you can muster against them, and any cavalry posts with which you can overawe god's enemy which is your enemy...

For these people, new sciences are an instrument, a weapon, and they eagerly try to locate them all around the world. Complex Purists also have a religious motive, but it is not the same as that of the other groups. They do not attain new sciences because the Prophet has commanded Muslims to seek knowledge, but because the Qur'an has commanded Muslims to defend themselves. In practical science policy, the complex Purists divide their power between both sides. They invest eagerly in modern sciences, but they demythologize them, i.e. they try to prove that modern science is not a means to truth but an instrument to satisfy the human will to power. There is no reason to love modern sciences as such, but there are enough practical reasons to learn them.

They make universities, but in each faculty, they oblige people to have a course in the Philosophy of Science. In philosophy of science they accentuate especially thinkers like Lakatos, Kuhn and Feyerabend, in order to prove the distorted nature of modern sciences, to show that modern science is not intended to satisfy our eagerness for knowledge but our needs in the sensory world. They promote Islamic studies with the same energy, seeking a pure Islamic knowledge which originates in the Qur'an and the Hadith in order to promote 'pure' Islamic knowledge among the people, especially in the realm of the humanities.

To conclude, it must be emphasized that all four of the above mentioned groups in post-revolutionary Iran, in spite of their divergent interpretations of the relationship between modern sciences and religion, have the same overall science policies, of course with different emphases and accentuations. Iran, according to its constitution, is an Islamic republic. Elections of the Guardian Council, even if not totally free, decide and determine the future of the country. The four above mentioned groups are the most important and strongest movements that compete with each other on the Iranian political stage. All of them have the slogan in common that we need more science and technology, and that answering this need is something Islamic. This means it is an Islamic duty for ourselves and for our country to promote scientific conditions for our people and our country. But under this overarching umbrella each of these movements has its own especial science policies and of course the appropriate domestic and foreign policies. Technocrats believe that: ‘we must learn modern sciences and technologies urgently and completely’. For someone like Dr. Soroush (in his late phase) the Qur’an is a religious book, and human beings can use it in some ethical and theological questions, and not more. We as human beings need all forms of modern science, and also modern humanities, which function as pillars of the modern world. For a selectivist like Ayatollah Khamenei it is clear that: ‘we can divide modern sciences from modern humanities, we need modern sciences and technologies but in humanities we must invest in Islamic studies to promote Islamic models.’ While technocrats support more open relations with other countries and cultures Selectivists are in this point also more selective; they try to control the scientists and the scientific works which are imported and exported, and to control scientific society and its power structure.

It must be mentioned that the model presented here, is more or less a conceptual model and in practical life different politicians and policy makers in different periods of their political career may show an inclination to more than one of these categories. There are few radical thinkers and politicians who belong to only one of these categories. Nevertheless, this model helps us to understand religious motivations behind science policies in Iran. More precise research according to this model would help to detect important finer differences in the above-mentioned categories, and this could be helpful in the analysis of the future role of Iran on the international political stage in the globalized world.

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