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Stefano Bigliardi

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Essay Review of Abdus Salam. Une oeuvre entre science et islam by Ismaël Omarjee, L'Harmattan, 2021.

SOCIÉTÉ DE PHILOSOPHIE DES SCIENCES (SPS)
École normale supérieure
45, rue d'Ulm
75005 Paris
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> "I have to say that I had never reflected on such questions before you asked them. (...) In the Qur'an it is said: if they ask you what is the soul, tell them that you don't know" [*Abdus Salam responding to a question about the soul*] (Vauthier 1990, 98)

1. Abdus Salam and the contemporary debate on Islam and science

In the 20th and 21st century multiple proposals have been advanced by Muslim intellectuals in regard to the best way in which Islam should be thought of in light of contemporary (natural) science, and *vice versa*. Such a debate has also been enriched by insightful contributions on behalf of Muslim scientists.[1] However, the figure of Pakistani physicist, Nobel laureate Abdus Salam[2] (1926-1996), has somehow remained marginal, notwithstanding his scientific stature and prestige, and his efforts to propagate ideas for the harmonization of Muslim faith and science, while encouraging the aspiration, on behalf of underprivileged countries including Muslim ones, to catch up with, and become autonomous in, scientific and technological development.

Noted as an outstanding mind since primary school, Abdus Salam had the opportunity to study mathematics and physics at Cambridge, where he completed his BA in 1949. Thirty years later, he shared the Nobel Prize in Physics with Sheldon Lee Glashow (b. 1932) and Steven Weinberg (1933-2021) "for their contributions to the theory of the unified weak and electromagnetic interaction between elementary particles."[3] He was the first Nobel laureate in science from an Islamic country and the first one from Pakistan. Abdus Salam famously cited the Qur'an in his Nobel acceptance speech: "Thou seest not, in the creation of the All-merciful any imperfection, Return thy gaze, seest thou any fissure. Then Return thy gaze, again and again. Thy gaze, comes back to thee dazzled, aweary" (67: 3–4). He elaborated: "This, in effect, is the faith of all physicists; the deeper we seek, the more is our wonder excited, the more is the dazzlement for our gaze."[4] Of himself, Abdus Salam clearly stated "I am both a believer as well as a practicing Muslim. I am Muslim because I believe in the spiritual message of the Holy Qur'an" (Abdus Salam 1984, 179).

A few years ago, while expressing his pessimistic views on Islamic societies and scientific education ("science resolutely refuses to take root in Muslim countries"), Abdus Salam's compatriot, admirer and erstwhile collaborator, physics professor Pervez Hoodbhoy (b. 1950), deplored that the Nobel laureate had been virtually forgotten in his native country, and couldn't therefore function as a role model for Pakistani youth (Bigliardi & Hoodbhoy 2017, 75). In 1974, the Muslim community Abdus Salam belonged to, the Ahmadiyya, was declared heretical by an amendment to the Pakistani constitution, *de facto* leading to a *damnatio memoriae* of Abdus Salam, in addition to being decisive in hampering his influence and action in Pakistan during his lifetime. That being said, additional factors may explain Abdus Salam's underrepresentation in global, contemporary philosophical, interreligious, and educational debates, including the suboptimal quality of some of the publications carrying his views,[5] as well as the complexity and occasional ambiguity of those very views, which call for patient and competent readers.

1 - For an overview and discussion of the contemporary debate on Islam and science, including the emergence of a "new generation" of authors with a background in the natural sciences, see Guessoum and Bigliardi, forthcoming (Chapter 2).
2 - Throughout the essay I shall stick to the complete, and more correct, form of the name (cf. Fraser 2008: 3-5); in 1974 Abdus Salam also adopted the forename "Muhammad" (Fraser 2008, 249).
3 - See https://www.nobelprize.org/prizes/physics/1979/salam/facts/ (accessed July 23, 2022)
4 - See Abdus Salam – Banquet speech. https://www.nobelprize.org/prizes/physics/1979/salam/speech/ (accessed July 23, 2022).
5 - I am, in particular, familiar with Abdus Salam's essays published in the rather dry and frankly unappealing anthology *Ideals and Realities* (Lai 1987). The collection, however, underwent two more editions, the third one being co-edited by Lai with Azim Kidwai.

2. Abdus Salam's thought through Omarjee's monograph

One important exegete of Abdus Salam's work and worldview is Ismaël Omarjee. His 2021 monograph *Abdus Salam. Une oeuvre entre science et islam* (hereafter abbreviated as AS) is the most recent of a series of varied contributions aimed at exploring and popularizing the figure of Abdus Salam and his thought, including a 1990 book-interview in French by the mathematician Jacques Vauthier, Gordon Fraser's 2008 Oxford University Press biography *Cosmic Anger*, a 2009 essay by scholar Martin Riexinger, and Anand Kamalakar's 2018 documentary film *Salam - The First ****** Nobel Laureate*.[6] I have read Omarjee's monograph equipped with first-hand knowledge of such contributions. Other biographical works mentioned by Omarjee are Jagjit Singh's 1992 *Abdus Salam. A Biography* and Pakistani physicist Mujahid Kamran's 2013 *The Inspiring Life of Abdus Salam*.

Omarjee's monograph is divided in two parts. As the author clarifies at the outset, the first part is functional to the second, which in its turn is functional to shedding light on the first one (AS, 9). The first section follows Abdus Salam through his life including his education, scientific work, political activism, and practical initiatives, the most important and successful of which was the foundation of the International Centre for Theoretical Physics (ICTP) in Trieste in 1964, which he directed until 1993 and now bears his name. In this section, the reconstruction of Abdus Salam's studies and research is generously integrated by Omarjee, in favor of those readers who may be less familiar with physics, with textboxes *ad hoc*, illustrating key physical concepts and theories. The second part of the monograph is the more theoretical one, since it elaborates on a point that Omarjee in fact emphasizes from the beginning and throughout the whole first part, that is, the centrality of Islam in Abdus Salam's thought as a scientist.

Abdus Salam expressed very clearly that developing countries could not grow by simply buying and importing technology, but that technology can only follow science. In other words, scientific education was imperative if one intended to pursue the economic development of an underprivileged country. He also emphasized that such development had to be planned and steered by competent public servants (claiming, *inter alia*, inspiration from Plato's vision: AS 160). Additionally, Abdus Salam showed acute awareness of the environmental problems caused by development itself, which threatened humanity's very survival. His concern for humanity with an emphasis on its underprivileged sectors was inscribed in an overarching vision of human beings as a family, the idea that humans should unite in solidarity and help each other to express their best selves (spiritually, ethically, and scientifically); while he stated that such a vision was rooted in the Qur'an, Abdus Salam also argued for it in reference to other sources of inspiration, for instance citing the mystic John Donne (1572-1631) (AS, 132).

Of all of Abdus Salam's propositions, plans and initiatives in favor of developing countries, the most spectacular and long-lived one was the foundation of the aforementioned center in Trieste, offering scientists from developing countries the opportunity to spend extended spells outside their home country while working on theoretical physics and benefiting from the exchange of ideas with prominent colleagues from around the world. This would result in creating an international network of scientists while also curbing the "brain drain" in those scientists' countries. Muslims, however, according to Abdus Salam, in addition to being involved in the process of scientific empowerment and development for third-world countries, had to play a primary and leading role because of their religion; in this regard, he wished for the creation among Muslims of a "scientific community" enjoying special treatment and protection, and transcending national and doctrinal boundaries (AS, 223). Elaborating on such concepts, Abdus Salam would conjure up the past greatness of science in the Muslim world, which he would explain in reference to principles and concepts drawn from religion. In other words, while discussing how scientific excellence appeared and flourished in the Muslim world during the so-called "Golden Age" (8th-11th century CE), Abdus Salam suggested that it was inspired by Qur'anic and prophetic[7] injunctions to reflect on God's creation (AS, 204-205; more on this anon). He also explained the decline of science in Muslim countries in reference to the impact of religious orthodoxy that promoted intolerance and smothered the spirit of research and creativity (AS, 213). Against such rigidity he prescribed *ijtihad*, or creative effort (AS, 214),[8] deploring the fact that all religions seemingly display a tendency to drift away from the principles of their respective founders; additionally, he expressed deep concern over the persecution of Muslims on behalf of other Muslims (AS, 215).

In the Golden Age of Islam Abdus Salam identified at least one precedent of a scientist that, like him, had worked towards a unification: Al Biruni (ca. 973-1050) who treated physical phenomena on the Sun, on Earth, and on the Moon as obeying to the same laws (AS, 171). More generally, Abdus Salam claimed that he could perceive in himself those very faith-science dynamics that one could appreciate within the scientists of the "Golden Age," and that to a good extent also explained the flourishing of science over such a historical period. In other words, as extensively elucidated and emphasized by Omarjee while constantly referencing Abdus Salam's

6 - The film's title faithfully refers to the inscription on Abdus Salam's tombstone and to how it was vilified by detractors; he was, however, the *second* Muslim to receive any Nobel Prize, after the Egyptian president Anwar Sadat (1918-1981), who was awarded the Nobel Peace Prize in 1978 with Israeli Prime Minister Menachem Begin (1913-1992).

7 - Omarjee acknowledges, however, that not all prophetic traditions are certain, from a historical-critical viewpoint, and that sometimes Abdus Salam qualifies as "scientific" some religious statements that don't necessarily refer to science (AS, 206 n. 22); cf. also Abdus Salam's interpretation of the Qur'anic concepts *tafakkur* (reflection) and *taskhir* (application of such reflection) as, respectively, "science" and "technology" - AS, 222.

8 - Omarjee also conducts a useful comparison between Abdus Salam's thought and the philosophy of Muhammad Iqbal (1877-1938), who advocated for a "reconstruction" of Islam based on science and ideally leading to a rebirth of Islam itself (AS, 223-230).

own statements, found in his speeches and essays or reported by those who interacted with him, "scientific thought" and "Qur'anic thought" fruitfully interacted in Abdus Salam. The Qur'an, along with narratives, practical prescriptions, and promises, conveys what one may call a basic but powerful *natural theology*: While the very text of the Qur'an is traditionally considered as divine revelation (transcribed and transmitted without human interference in the text), multiple Qur'anic verses underscore the importance of observing the regularity and beauty of natural phenomena and encourage to consider them as signs pointing to the existence of a rational, benevolent, and all-powerful God. Therefore, the study of those very phenomena can be seen as an act of worship and as one way to approach God.[9]

3. Faith and science in Abdus Salam: additional clarifications and comparisons

All these observations, however, need not mislead us and induce us into hasty, oversimplified conclusions. To start with, it is crucial to underscore that Abdus Salam did recognize that Muslim faith could provide *him* with (some kind of) inspiration in his scientific endeavors but did *not suggest that Islamic faith* (or religious faith) is, or should be, the *one and only inspiration for everyone*. This could only be obvious to a man who excelled in a field that can only prosper and advance if a myriad of minds engage in intensive exchange and interplay - minds that share the same methodology but that inevitably come from, or are immersed in, the most different cultural backgrounds. Abdus Salam fully appreciated the importance of collaboration and interconnection among experts for his own work,[10] and he wanted to secure them for his colleagues in underprivileged countries.

Abdus Salam's claim that his faith could have inspired his work, and the simultaneous insistence that that needn't be the case for each and every colleague is in fact a delicate point warranting careful unpacking. I shall discuss it in light not only of Omarjee's monograph but of Abdus Salam's aforementioned conversation with Jacques Vauthier (some of whose passages are extensively quoted by Omarjee).

Initially, in his dialogue with the French mathematician, Abdus Salam stated: "I have always been fascinated by the symmetry and the harmony of the world. This may come [*peut venir*] from Islam, because, in Islam, one contemplates the universe created by God with ideas of beauty, symmetry, and harmony. The Qur'an insists a lot on the laws on nature" (Vauthier 1990, 19). Later, however, prompted by a specific question by Vauthier ("Did your faith influence your research?") Abdus Salam did acknowledge that he was "guided by the quest of a certain harmony in the mathematical theory serving as a model for the unification of the weak nuclear forces and the electromagnetic ones" (Vauthier 1990, 71). In this latter reply, any perceptive reader can notice a slight but important shift in comparison with the earlier reply: here, Abdus Salam was conjuring up the idea of harmony alone - an idea that certainly *can* be conveyed by, or encapsulated in, an Islamic worldview, but also in other religious worldviews, or that can even be embraced without any religious reference whatsoever.[11] Indeed, Abdus Salam immediately added that his colleague had arrived at the same results while not perceiving a divine plan in the universe;[12] "you see that I cannot say that it was thanks to my faith alone that I have succeeded!" stated Abdus Salam, and concluded: "my faith is therefore of little importance in this context" (Vauthier 1990, 71). Then, further asked by his interlocutor to specify whether there was a total dichotomy between the man of science and the man of faith, he elaborated as follows: "No. I feel this unity very strongly. But the fact that the same thing can be written by someone who doesn't share my sensibility demonstrates that scientific activity isn't necessarily linked to a faith" (Vauthier 1990, 72 -also cited in AS, 240).[13]

In yet another text written in the same year in which the dialogue with Vauthier was published, Abdus Salam stated that he may have been "*unconsciously* motivated by [his] background as a Muslim" (Abdus Salam 1990: x, emphasis added). Seemingly, Abdus Salam didn't make things easy for his readers: the allusion to an *unconscious* motivation makes the idea of Islamic/Qur'anic motivation even more elusive.

In fact, some interpreters of his ideas seemingly opted for a heavy downplay of the very interaction of Islam and science in Abdus Salam's work. This is, paradoxically, the case of Vauthier himself in his introduction to the conversation with Abdus Salam, where he writes "the Muslim that is Abdus Salam shows us that, *although his faith hasn't particularly guided him in his research*, it inspires in him a very strong ethical demand" (Vauthier 1990, vii; emphasis added). And Martin Riexinger states that Abdus Salam "kept his personal religious beliefs and his professional scientific work clearly

9 - Along similar lines, one can claim that each and every activity aimed at creating harmony and beauty harmonizes with Muslim faith. In fact, Omarjee also explains Abdus Salam's activism in favor of developing countries as connected to the Qur'anic concept of beauty (AS, 110).

10 - Fraser writes that Abdus Salam "learned that he functioned best when he worked with a partner with whom he could argue out his ideas and who could channel his inventiveness" (Fraser 2008, 94; cf. also 151).

11 - In fact, *beauty*, *symmetry*, and *simplicity* are almost invariably invoked by scientists as distinctive marks for good theories and therefore also as guiding ideals in their elaboration. Omarjee reports for instance that when Sheldon Lee Glashow (b. 1932) and James Bjorken (b. 1934) advanced the existence of a fourth quark "their motivation was primarily aesthetic: if quarks and leptons are the fundamental entities of nature, there should be a parallelism between them" (AS, 80).

12 - Hoodbhoy, a staunch advocate of the separation of science and religion, would emphasize in his 1991 book *Islam and Science: Religious Orthodoxy and the Battle for Rationality* that Abdus Salam and Weinberg were "geographically and ideologically remote from each other when they conceived the same theory of physics" (Hoodbhoy 1991, 78). And, in the Preface Abdus Salam wrote to Hoodbhoy's book, he expressed agreement on this point (Abdus Salam 1990, x)

13 - On a side note, a full reconstruction and appreciation of Abdus Salam's conceptualization of Islamic inspiration in his work defuses an objection raised by journalist and public intellectual Tariq Ali (b. 1943), who states, in Kamalakar's documentary, that he wonders whether Abdus Salam would have developed the same breakthroughs had he been a Punjabi non-Muslim..

apart," adding "it is impossible to detect any hint to suggest that the former influenced the latter" (Riexinger, 2009: 319).

While a total denial of the interplay between religion and science in Abdus Salam's work seems like an oversimplification that doesn't do justice to Abdus Salam's own statements in such a regard, it is more than legitimate to wonder how one can make full and consistent sense of all the aforementioned statements by Abdus Salam. To begin with, it would be exaggerated to claim that Abdus Salam wasn't expressing genuine feelings and thoughts. However, it is also true that denying the existence of *any* connection whatsoever between Islam and science wasn't an option for him: such a statement would have lent itself to reproval on behalf of Muslim critics and, more in general, it would have represented a missed opportunity to inspire a Muslim readership. Additionally, while suggesting a personal but not necessary and universal link between Islam and science, Abdus Salam was also positioning his thought in contrast to some powerful currents of thought that emerged in the Muslim world in regard to religion and science and were advanced, respectively, by two philosophers: the Palestinian-US-American Ismail Raji al-Faruqi (1921-1986), and the Iranian-US-American Seyyed Hossein Nasr (b. 1933).

Al-Faruqi was deeply concerned with the condition of the *Ummah*, that is, the Muslim community worldwide. He regarded wide-ranging social reformation and political unification as essential in invigorating the *Ummah*. Such an empowerment was conditional on the restoration of what al-Faruqi regarded as Islam's pristine condition, uncontaminated by Western principles. In particular, al-Faruqi regarded science as imbued with Western ideals. All of knowledge, including science, had therefore to be re-cast based on Islamic principles, and taught accordingly. The Islamization of knowledge/science, while yielding little to no real output in terms of an actual reformation of science (or of any branch thereof), fascinated a significant number of Muslim intellectuals and resulted in many publications and conferences.

Nasr earned a degree in physics at MIT as well as a Master's degree in geology and geophysics, and a PhD in the history of science, both at Harvard University. He was, however, influenced by anti-modernist philosophical views and came to doubt that physics truly allowed one to understand reality. Importantly, Nasr is a Sufi master, that is, he engages in spiritual practices and rituals that are said to lead to direct contact with God. In fact, he thinks that humans are endowed with a "supernaturally natural function" that he calls the Intellect, through which they can "know the Absolute," that is, reconnect with God and access intellectual levels superior to ordinary perceptions (Nasr 1981, 2-5). Nasr regards contemporary science as characterized by the absence, indeed the negation, of God, and by fragmentariness; such elements, in his opinion, also explain why technology is so destructive. Only the reconnection to God, according to Nasr, can cure such ills and save humans from what they regard as progress but that is, in fact, mass suicide. In this regard, Nasr is convinced that a religion-imbued way of attaining and constructing knowledge should be implemented, that he calls *scientia sacra* ("sacred knowledge") including reference to supernatural levels of reality. In sum, science according to Nasr should be practiced in a way reminiscent of ancient cosmologies. To this day, Nasr, a prolific writer, is a respected Muslim intellectual who can count on a significant following (for a highly readable overview of his ideas, see Nasr & Iqbal 2007).

Considered from Abdus Salam's perspectives, such proposals could only be regarded as an unwelcome overstatement of the inspirational role of religion towards science, and one that distracted intellectual forces and resources that could be put to a better use. In sum, referring to an important, yet *not necessary and universal*, link between Islam and science, was suggesting a good alternative to programs and visions like those advanced by al-Faruqi and Nasr.[14]

Abdus Salam was not suggesting either that science can achieve a full comprehension of the divine. This, for at least three reasons: science is fallible, and so are scientists, while God manifests his plans *also* through nature but he is ultimately unfathomable. As cited by Omarjee, Abdus Salam specified that, although one in fact *failed* most of the time while trying to "uncover God's thought," there still was "a great satisfaction in identifying a *minuscule part* of the truth" (AS, 110; emphasis added). Also, Omarjee mentions how Abdus Salam sometimes could see beauty where his colleagues saw none, and that he felt frustrated over his own inability to express and convey such beauty (AS, 112 - citing Fraser 2008, 282). Most importantly, Abdus Salam was convinced that God was ultimately irreducibly transcendent, and refused to identify mathematics with God's language; he also pointed out that science could be universal, but just as a language, while a veritable unification of humanity could come through Islam (AS, 112).

In sum, Abdus Salam did not suggest that science and religion are essential to each other. To be sure, in his vision they are related but neither can be said to depend on the other one, or to be linked in a necessary way. While he regarded scientific inquiry as one way of nourishing faith,[15] he underlined that *faith is not conveyed by science* itself, and that a vision of science like his own *is preceded by faith* (that, in his case, had been transmitted by his father's teachings) (AS, 184). Additionally, he expressed appreciation for aspects of religion that can be perceived outside the scope of scientific activity. He was confident in the power of prayer in times of distress (AS, 185) and described religion as being "something very personal" in a spiritual sense, and fulfilling a human need (AS, 187). All this beautifully dovetails with the way in which Abdus Salam conceptualized science, clearly stating that "the traditions and the modalities of science are universal" (Abdus Salam, 1984: 194) so that Islam, *like other faiths*, can enjoy a "harmonious complementarity" with science. The universali-

14 - In fact, the very title of Lai's anthology (1987) recalls the title of a famous book by Nasr (1966).
15 - In the conversation with Vauthier he stated for instance that "science is a marvelous tool to stimulate imagination, but also to cultivate religious feelings in the presence of nature's wonders" (Vauthier 1990, 36).

ty and objectivity of science would eventually be emphasized by Hoodbhoy in his own contributions to the debate over Islam and science (Hoodbhoy 1991).

4. Abdus Salam's thought: further questions and challenges

Without a doubt, the reconstruction of Abdus Salam's thought is a laudable endeavor, also considering that, as pointed out by Omarjee, his religious, philosophical, and ethical vision remained largely misunderstood, including among his coreligionists (AS, 160). Omarjee does a fairly effective work at connecting and contextualizing Abdus Salam's ideas scattered across different essays, interviews, and speeches, and explaining them in light of one another. I wonder, however, whether such a discussion could have benefited from some additional comparative work in reference to other voices in the debate over Islam and contemporary science. I also suspect that a clarification of Abdus Salam's vision could be fruitfully developed in light of one or more theoretical models for the interaction of religion and science (see for instance the proposals advanced in Barbour 2000, Stenmark 2004, Peters 2018).

Another question is treated by Omarjee as somewhat marginal: that of Abdus Salam's affiliation with Ahmadiyya, and the influence that it may have had on his views. Generally, in his public expressions of religiosity and references to Islam, Abdus Salam would rather underscore his *Muslim* faith and identity. This can easily be read as a strategy to avoid alienating Muslims the world over, towards whom he consciously strived to play an exemplary role (cf. Riexinger 2009, 324), as well as a challenge to the very branding and rejection of Ahmadiyya as heretical in Pakistan. This doesn't mean, however, that Abdus Salam *never* elaborated on the Ahmadiyya. For instance, in the conversation with Vauthier he did emphasize that Ahmadiyya "preached peace, devotion, and loyalty to the existing government" underscoring that this stood in contrast with the majority of Muslims in the Punjab (Vauthier 1990, 2). Riexinger points out that the way in which Abdus Salam conceptualizes the relation of science and religion includes reference to *one* Ahmadi principle - the belief in the regularity of nature; such a belief, however, within Islam is not exclusively Ahmadiyya's (Riexinger 2009, 324); for instance, it played a prominent role in the philosophy of science advanced by the Indian Muslim modernist reformer, Sir Seyyed Ahmad Khan (1817-1898).[16] It would be interesting to see more scholarly work on how Ahmadi views on science and other relevant subjects may be comparable to, or possibly diverge from, those of Abdus Salam.[17]

As I already have hinted at, Abdus Salam's reflections and contributions to the debate over Islam and science were conditioned by what one may call diplomatic constraints. In other words, he shaped and used his speeches and essays as political (*lato sensu*) tools: therefore, he had to be very careful not to alienate interlocutors or potential allies from other faiths, or atheist/secular ones. Furthermore, Abdus Salam was sometimes offering his thoughts quite spontaneously and therefore unsystematically. For instance, when asked by Vauthier about his stance regarding supernatural miracles, he sketched a position reminiscent of Sir Seyyed Ahmad Khan's, stating that he wasn't inclined to believe in miracles since natural explanations could be available (Vauthier 1990, 93); he also pointed out that the Prophet refused to perform miracles (Vauthier 1990, 95). One hardly fails to notice, however, that Abdus Salam was glossing over the existence of Qur'anic narratives that *can be* (and in fact *have been*, and *are*) interpreted as supernatural.[18] And, in the same conversation, after Vauthier prompted him to elaborate on the concept of soul, Abdus Salam candidly admitted that he never had thought in depth about it (Vauthier 1990, 98). Finally, one should consider that Abdus Salam, while certainly well-read, wasn't an academic expert in Islamic thought and in the history of Islamic science,[19] let alone in the philosophy of science broadly conceived. All this, I feel, inevitably makes for the presence of subtle contradictions or weaknesses in his thought that anyone who sets out to produce a unified and consistent account of his positions is invariably confronted with.

In the previous section, I have been careful to emphasize the contrast between the approaches of al-Faruqi and Abdus Salam. Paradoxically, however, both proposals raise doubts in regard to the crucial concept of *unity*. Al-Faruqi, who wrote from a philosophical and theological background, dedicated a whole book to the concept of *tawhid* (al-Faruqi 1995), that is, the unity and unicity of God, a central theological tenet of

16 - Riexinger also observes that Ahmadiyya's founder Mirza Ghulam Ahmad (1835-1908) was influenced by Sir Seyyed Ahmad Khan and promoted for instance a metaphorical interpretation of supernatural narratives, except that he himself claimed prophetic gifts and claimed his prayers could change the course of the future (Riexinger 2009, 319).

17 - In fact, one may even opt for a more nuanced reconstruction of Abdus Salam's religiosity overall. Gordon Fraser, while recognizing the inspiring role of religion in Abdus Salam's endeavors (cf. Fraser 2008, 7, 108-109) also questions, although very tactfully, the continuity of Abdus Salam's faith, pointing out episodes in which he did not abide by Islamic rules and describing how his religiosity was revamped following the pilgrimage known as *Umrah* (Fraser 2008, 215; 283-284).

18 - The Prophet's refusal to perform miracles on demand and the Qur'an's emphasis on the fact that unbelievers always find reasons not to believe (cf. Q 6: 7-10) can be read as a shift of emphasis from the person of the Prophet to the revelation he received and therefore to God; interestingly, one can find a strong parallel in Jesus' teaching (Mt. 12:38–40). That being said, the Qur'an does contain narratives regarding events that, taken at face value, can be considered supernatural, some of which are even shared with the other major monotheistic religions, including Moses' staff turning into a snake and the parting of the Red Sea.

19 - Riexinger points out that, in his historical references, Abdus Salam wasn't always accurate and seemed rather "overenthusiastic" (Riexinger 2009, 323). In the conversation with Vauthier, Abdus Salam underscored that in the Muslim world there had never been a "Galilei affair"; on this last point, however, his interlocutor pressed him pointing out that in 1982 an Islamic authority had officially supported geocentrism encouraging the persecution of the advocates of heliocentrism, and Abdus Salam, while stating that in that particular case it was one man's opinion and not a statement by an institution, ultimately admitted that, in the Muslim world, scientists had been persecuted (Vauthier 1990, 53-54).

Islam. As I briefly explained beforehand, he was convinced that science, being empirical and skeptical, had become a vessel of atheism and that such atheism was becoming all the more dangerously fascinating due to the practical success of science-based technology. Another problem perceived by al-Faruqi (in fact not differently from Nasr) was that science was practiced in an extremely specialized way, each expert focusing on a tiny fraction of reality. In sum, embracing science according to al-Faruqi entailed entertaining concepts that collided with a religious view, and induced its practitioners into losing sight of the harmony and interconnectedness of the cosmos. Therefore, according to al-Faruqi, science was in urgent need of an epistemological reformation through the infusion of Islamic concepts, starting with *tawhid*. He even stated that "God is the *necessary condition* of all natural science" (al-Faruqi, 1995: 53; emphasis added).[20] Originally, however, Islam's emphasis on the unity and unicity of God underscores the difference between Islam's absolute monotheism *versus* Christian and polytheistic conceptions of divintiy. Al-Faruqi seemingly read the unity and unicity of God in connection with the aforementioned Qur'anic natural theology, conceptualizing God as the *only*, and *unique*, source of all natural phenomena, and therefore the guarantor of their interconnection, regularity, rationality and intelligibility. Here one can detect an uncanny analogy with Abdus Salam's ideas. Kamalakar's aforementioned documentary includes the following statements in Abdus Salam's own voice: "If you are a particle physicist you would like to have just one fundamental force and not four. That's the real unity, between the forces. If you are a Muslim particle physicist of course you will believe in this very, very strongly because unity is an idea which is very attractive to you, culturally." Upon hearing such words, one cannot help feeling that both al-Faruqi and Abdus Salam, while certainly offering deeply different visions, were both subtly turning a *theological* principle into an *epistemological* (or at least science-inspiring) one. Such a connection, or leap, is in fact far less intuitive than it may sound, and the exact reason why, since there is One God, the forces of nature should unite in some way, surely warrants further elaboration.

Abdus Salam cited the French author Maurice Bucaille (1920-1998) to the effect that the Qur'an contains no passages incongruent with modern scientific information (Abdus Salam, 1984: 180; also cit. in AS, 207; also remarked by Riexinger 2009, 323-324). This reference is quite problematic. Bucaille, a physician by training and profession, is something of an evergreen celebrity among Muslims. In the 1970s he bestowed unprecedented visibility and popularity on the idea, elaborated upon by multiple predecessors, that the Qur'an contains a wealth of passages describing with accuracy scientific notions that humanity would study in detail only centuries later (and that therefore are indicative of the Qur'an's divine origin). The French author advanced his views in *The Bible, The Qur'an and Science* (Bucaille 1976): an enormously popular book in which he professes to embrace scientific standards while in fact being quite unsophisticated from a theological and philosophical viewpoint. To be sure, citing an author on one specific point is not tantamount to embracing their views wholesale, but one inevitably wonders whether Abdus Salam was deeply familiar with Bucaille's work and ideas, considering their divergence on other crucial points. For instance, in his book, Bucaille took supernatural narratives literally (cf. Bigliardi 2011).[21] The exegetic approach that Bucaille boosted opened the door to a plethoric production of poor-quality, pseudoscientific works, so much so that the French physician and his imitators were toughly criticized, indeed ridiculed, by Pervez Hoodbhoy in his 1991 monograph *Islam and Science: Religious Orthodoxy and the Battle for Rationality*. And in his Preface to Hoodbhoy's work, Abdus Salam stated he did not disagree with anything Hoodbhoy had written therein (Abdus Salam, 1990: ix).[22] Also, in Kamalakar's documentary one can hear Abdus Salam recalling how some Qur'anic verses were seen by some as reminiscent of the Big Bang, adding: "I do not. [...] It would be absolutely stupid to try to connect the science of today to what is essentially allegorical, religious, spiritual experience which I think is a totally different dimension." Of course, that the Qur'an *anticipates science* and that it *does not contradict science* are distinct claims; however, if one is deeply convinced that scripture and science belong to "totally different dimension[s]" then perhaps they should deem the latter claim irrelevant.

5. Concluding Thoughts: the charme and pitfalls of cognitive romanticism

I would like to conclude these pages offering some complementary thoughts concerning the relevance of research like that of Omarjee, and the interpretation of its results within the debate on Islam/religion and science. Omarjee states that his work belongs to a "biographic genre" that "focuses on the man's intelligence (...) invoking a unifying and creative quintessence that characterizes the thinker's personality"; in other words, Omarjee sees himself as engaged in "an exercise of unified comprehension of the personality and work of thinkers of the first rank, that allows one to better understand them" (AS, 249). I have no doubt that Omarjee's reconstruction accurately reflects the way in which Abdus

20 - Seemingly, al-Faruqi did not realize or fully consider that a scientist can embrace *methodological naturalism* (that is, an empiricist methodology *excluding* supernatural causes from *scientific explanations*) in their field while uncoupling it from *ontological naturalism* (the *rejection* of the existence of any supernatural beings). In this regard, it is interesting to recall that Abdus Salam denied that "modern science must lead to 'rationalism,' and eventually apostacy [sic]" (Abdus Salam, 1984: 183). Also, al-Faruqi did not realize that what he was prescribing was, at best, the Islamization of a *scientist's worldview* rather than of the very *method* of science.

21 - Additionally, Bucaille did not embrace Darwinian evolution, claiming *inter alia* that the fossil record was incomplete and that the similarities between human beings and apes had been overstated (Bucaille 1981). In 1991 Abdus Salam produced one paper at the interface of physics and molecular biology (Fraser 2008, 244-245) and it is quite dubious he would have subscribed to Bucaille's rejection of evolution.

22 - To be sure, Abdus Salam never engages in the controversial and somewhat shallow interpretation known as "scientific miraculousness" of the Qur'an; however, as we have seen in footnote 7, he did occasionally advocate a somewhat overstretched interpretation of some Qur'anic concepts.

REVUE DE LA SOCIÉTÉ DE PHILOSOPHIE DES SCIENCES

Salam perceived and presented his own creative processes. In this sense, I do not deny that *Abdus Salam. Une oeuvre entre science et islam* equips its readers with useful tools to understand the figure of the Nobel laureate. And on a general note, to be sure, I certainly do not contest that theories on the harmonization of faith and science are valuable. At their best, they can take care of one's possible dissonance between religious and scientific concepts, and promote a useful and healthy understanding and practice of science.

However, Omarjee also writes that his is a "work within the philosophy and the psychology of research and creation, that involves religious psychology" (AS, 249), which allows one to better understand the relationship of science and religion (AS, 250). In other words, he suggests that the way in which religion and science are intertwined in Abdus Salam's thought is the manifestation of a fruitful *psychological* interplay that one can also observe, for instance, in Isaac Newton (1643-1727) and Georges Lemaître (1894-1966)[23] and that, according to Omarjee, may be researched also in regard to other scientists (AS, 251). On this point, however, I beg to differ. My concern is that the processes of thought described by Abdus Salam may not be deemed *genuine* at a deeper level, if by "genuine" we do not just refer to the theories' faithfulness to the scientist's self-perception, but to how such processes *really unfolded in his mind*. Surely, claims and narratives advanced by different scientists in regard to the origin of their intuitions, breakthroughs and discoveries make for a rich literature, and even include oneiric visions or episodes of inspiration provided by symbols that those scientists associated with positive emotions. I am thinking, for instance, of the reverie about a snake biting its own tail that, according to Friedrich August Kekulé (1829-1896), provoked in him an intuition of the structure of the benzene molecule[24] but other examples may be easily found as well.

Neurosciences have been making giant strides towards achieving refined accounts of thinking processes. And, often, their results strongly suggest, indeed *demand*, a major overhaul in the vocabulary used in everyday language, but also in the philosophical tradition, to understand and explain how humans think. We have just started to gauge the magnitude of the paradigm revision pushed by such results.[25] In fact, in light of the results of the cognitive sciences one sometimes gets the feeling that non-experts may be as much able to describe human "inner workings" as ancient and medieval physiologists were to describe human anatomy. Additionally, the very structure of biographical (and autobiographical) narratives misleads into focusing on *one* thinking subject as the "seat" or "arena" of intellectual processes and discoveries, overlooking that they in fact result from a myriad, dynamic interactions within a net of collaborating minds. In light of such considerations, one is led to think that major scientists and thinkers, while having reached the apex of proficiency in their respective fields and having substantially pushed those fields' very boundaries, or even revolutionized them, may have been still attached to, or influenced by, paradigms and terms traditionally used for the description of one's "inner processes" that may ultimately prove obsolete and inadequate. In other words, they may have produced essays in what one could call, with a touch of humor, "cognitive romanticism."

What I am trying to suggest is that Abdus Salam in all likelihood was no exception. He may have chosen to account for his own psychological processes as a scientist by emphasizing the inspiration provided by Islamic concepts while considering those concepts' subjective or emotional significance, and their usefulness in political discourses, when in fact he was referring to a whole bundle of psychological phenomena that ultimately were opaque to him. While this choice is perfectly understandable and, in the case of Abdus Salam's essays and speeches as well as in many other scientists' ones, it certainly makes for entertaining and motivational literature, it should not be overstated. In fact, if carried away by Abdus Salam's cognitive romanticism, one may even end up feeling inclined to attribute to him teachings reminiscent of those Muslim positions that in the previous pages I have been careful to distinguish from his own.

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23 - Omarjee has a special expertise in these two authors, which he explored in his PhD thesis (Omarjee 2010).

24 - See the citation from Kekulé's 1890 lecture that opens Sutton 2015.

25 - Consider for instance the suggestions advanced by Damaso 1994: the whole commonplace (and philosophical) split between "reason" and "emotion" may be completely ill-founded and misleading.

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SOCIÉTÉ DE PHILOSOPHIE DES SCIENCES (SPS)
École normale supérieure
45, rue d'Ulm
75005 Paris
www.sps-philoscience.org

CONTACT ET COORDONNÉES :

Stefano Bigliardi
Al Akhawayn University in Ifrane