



The Reform Project

Progressive, enlightened voices from the Arab Muslim world

Towards a

Model Curriculum

*For the reform of the educational syllabus
in the teaching of the humanities*

Part II:

The Route to Knowledge

Scheme

The purpose and method of this curriculum	3
PURPOSE: Dismantling the quarantines	5
Confusion and dilemma – an intellectual identity crisis.....	6
The modernity / West conundrum.....	12
The perils of an ‘epistemological exception’	16
METHOD: The promotion of comparative cultural study on the development of science	18
The emergence and fading of Islamic science.....	19
The mechanism of scientific progress - philosophical method.....	21
The institutionalization of independent centres of learning	28
The emergence and establishment of the ‘scientific method’.....	29
RESULTS: diagnostic conclusions from the comparison.....	34
The judgement of history	35
The value of comparative cultural studies.....	37
The contemporary debate on Islam and science.....	39
The ‘new generation’ of scientist scholars	44
The problem of conflicting views between scripture and science	45
Mitigating the tension	47
Works cited	50
Arabic texts	53

The purpose and method of this curriculum

The aim of this *Model Curriculum* is to address the basic problem highlighted by the 2003 *Arab Human Development Report* – the role of an unreformed pedagogy, as currently prevails, in impeding the development of a knowledge society. It also aims to counter the current advancing Salafisation of the educational sector, through proposing a reform model that breaks open the closed circle of intellectual and doctrinal space that is proving resilient to reform.

Given that the intellectual, philosophical and analytical mode of thinking is a mentality not fully indigenised to Arab students, who have been schooled by indoctrination and rote learning, the theme of contemporary modern culture and approaches to knowledge acts as a preliminary preparation to this syllabus. This module will seek to facilitate the absorption of modern methods of knowledge accumulation and evaluation, and inculcate an understanding of the nature of knowledge as an attitude and an approach, rather than a finite body of wisdom to be revealed to the labours of the worthy or the pious. It will train the student to nuance his decisions according to the methodology of evidence-gathering, evaluation and testing, and establish the propriety of doubt as affirming, rather than enfeebling, the scientific endeavour.

It will thus prepare a generation of students capable of distinguishing religious truths inherent in religious faith from scientific truths focusing on the realities of the physical world. By so doing the student will see the irrelevance of ‘red lines’ and falsely erected arenas of ‘conflict’.

A focus on the humanities

The *Model Curriculum* that follows thus focuses on the humanities, since of the constituents of modernity this is the principal area that educational systems in the Muslim world have quantitatively prioritised, but qualitatively underperformed, and indeed in some cases have consciously set out to evade.¹

The teaching of the humanities has been the most resistant to change and updating, and as a result of its domination by a conservative-minded, and change-resistant, clerical class has been the most vulnerable to ideologisation. As the biographies of militant extremists trained as doctors and engineers has demonstrated, technologies can travel and be absorbed (though not innovated) as a ‘finished product’ without the cultural and intellectual underpinning that brought them about.

But the contemporary approach to the humanities, and the philosophy of knowledge underpinning the natural sciences, cannot be so easily accommodated by Islamists since they require an approach that is entirely at odds with their ideologised starting-points. The fostering of critical, evidence-based methodology will have its inevitable reflection in the development of independent critical judgement, and this will in turn open up new vistas of creativity, in fields not confined to the arenas of science and technology.

Healing narcissism and increasing self-confidence

The effect of this focus and approach will be to heal the cultural and doctrinal narcissism, to dismantle the ‘quarantines’ mentioned in the *Introduction* and allow the Muslim unfettered access to the modern world in something more than its economic and technological spheres.

The operative deficit underlying the Arab failures to date is *self-confidence*. The more thoroughgoing the defeat of narcissism, the freer the engagement enabled with the culture of the Other, the stronger the self-confidence will become to engage with this culture and the more solidly embedded the self-respect gained from the ever-accumulating vistas of participation and achievement.

¹ Cf. the observation of Lafif Lakhdar: “The ancestor-worship which dominates religious education and Qur’ānic sciences, including language, literature, and grammar, has succeeded in sidelining the humanities which specialised in studying religion, such as the comparative history of religion, the sociology of religion, and suchlike. It resulted in a relentless war against the studies of humanities and called for their Islamisation, stripping them thus of their critical momentum.” Lafif Lakhdar, *Moving from Salafi to Rationalist Education* (contributing paper to the *Conference on modernity and Arab Modernity*, Beirut 2004).

The reform of Muslims' interaction with Islam is central to this endeavour

Given that the reform deficit, particularly in education, has made Islam a part of the problem for contemporary Muslims, the task of reformers is to turn it into part of their solution. The high road to realizing this reform is for an enlightened religious education to replace narcissistic religious education, a vision that replaces the requirement for self-segregation from the 'contamination of the infidel' with a faith that promotes symbiosis, interaction and an active celebration of the commonalities of ethical standards, the arbitration of conscience, mutual respect and empathy.

If Muslims are to see the totalitarian vision of the Islamists de-legitimised, the task before them is to reverse the formula that prioritises antiquity over the present. An alternative formula for Islamic identity and authenticity has therefore urgently to be found, one that is authentic to a dynamic spirit rather than a fixed letter, and one that *makes modernity in Islam the authoritative voice*. It is this indigenisation of modernity into Islam, as opposed to the supremacists' attempt to 'Islamise modernity' by imposing its cultural and religious norm on others, that will secure the access and participation of the Muslim in the contemporary discussion, and in so doing secure the future of Islam.

The diagnosis that progressive Muslim educationalists put forward focuses on this transformation, on an educational syllabus that inculcates a new conception of the Islamic heritage. It is thorough-going and radical – essentially *the deconstruction and re-building of the entire edifice of Arab-Islamic thought*. For it is only after such a deconstruction of the nature of Arab-Islamic thought has taken place that the fundamental building-blocks of modern values such as secularism, religious freedom, human rights and the fraud-free democratic process have a chance of taking root.

PURPOSE: Dismantling the quarantines

The first task in the process of reconnecting the Muslim to the intellectual infrastructures of contemporaneity, as mentioned above, is to dismantle the quarantines. To do this requires, first of all, an admission that a problem as such exists. But there are some internally functioning defense mechanisms that are stalling this awareness process, mechanisms such as apathy, theology, narcissism and intimidation.

Observing the *apathetic* response to calls for reform, Mohamed Sanduk notes how “Arab thought still looks upon the decline as some form of natural phenomenon”, so that while Arab societies constitute in this respect a “strange case in the history of human society”, the periodic calls for resurgence and modernisation essentially remain inactivated and contemporary Arab thought simply “fails to make an attempt at studying this historical discontinuity and its causes”.²

This ‘cultural extinction’ of the Arabs³ is effectively ignored by a *theological* ‘diagnosis’ of failure and recovery, one that is adroitly dressed in the language of piety and the divine promise of revival. There is no fault, under this scheme, that cannot be rectified by a more assiduous attachment to the same underperforming pattern of heritage. The advantage for the orthodox position is this: if the cultural formula is divorced from the in-workings of time and place, the formula cannot be invalidated by any evidence of inconsistency or failure. With very few exceptions, Arab intellectuals have to date failed to address the most important issue – the issue of a serious critical study of the Islamic heritage – and simply have not dared to enter into the arena of religious and theological thought.⁴

The requirement to address the failings is further complicated by inappropriate reactions, powered by a cultural narcissism sensitive to any type of criticism, be it social or scientific. These reactions may be expressed in otiose *ad hominem* rejoinders on the failings of non-Muslim societies, or irrelevant accusations of ‘racism’ or ‘Islamophobia’. “There is no forgiving wounded pride”, argued Lafif Lakhdar, “only vengeance can assuage the pains for a while, in the expectation of a renewed insult and a new act of revenge.”⁵ The calls upon the UN for laws prohibiting “the defamation of religions” is but one more example of this avenging chauvinism that demands a deforming exceptionalism to be implanted into the global rules of cultural engagement.

Arab intellectuals risk much from the charge of ‘re-drawing the doctrinal map according to intellectual trajectories deriving from the West’. The *intimidation* is undisguised: to pose questions on the inherited norms in public debate, as Dr Soheib Bencheikh laments, is to

run up against the most far-fetched type of denunciation and accusation: you are in the pay of the West, you are serving American interests, you are conniving with the Zionist enemy, or are simply an apostate deserving of the death penalty that the ancient theologico-juridical legal corpus stipulates.⁶

² M. al-Sanduk, “Intellectual self-isolation and the prospects of constructing a culture.” *Almuslih.org*

³ See the comments of Ali Ahmad Sa‘id (‘Adonis’) above.

⁴ A notable exception is Mohamed Arkoun. On this see Hashem Saleh, ‘Mohammed Arkoun on the Golden Age and Beyond’, *Almuslih.org*.

⁵ Lafif Lakhdar, The Reform of Islam is both Necessary and Possible, *Almuslih.org*.

⁶ « Les sociétés musulmanes refusent toujours d'ouvrir ce débat. Au contraire, soulever publiquement ces questions aujourd'hui c'est encourir les blâmes et les accusations les plus invraisemblables : c'est se mettre à la solde de l'Occident, servir les intérêts américains, être en connivence avec l'ennemi sioniste, ou s'avérer simplement renégat méritant ainsi la mise à mort légale comme le stipule d'ailleurs ce même vieux corpus théologico-juridique. » Soheib Bencheikh, ‘La propagande de Daesh et le fantasme de la venue du Mahdi, “sauveur des musulmans”’, interview by Stéphanie Plasse in *Jeune Afrique*, March 5 2015.

Confusion and dilemma – an intellectual identity crisis

This issue of the ‘western trajectory’ of modernity is the sticking point. The inexorable intrusion of the practices of modernity is generating equally opposing, equally self-contradicting forces: rejection to the point of rupture with modernity as a western interloper or the embracing of this modernity to the point of rupture with the Islamic heritage. “The crisis of the Arab mind”, argues Wael Farouq,

lies in a lack of harmony with time and space, or – better – in a lack of harmony *between* time and space: The traditionalist lives ‘here’ but is estranged from the ‘now’, because he dwells in the glorious past; the modernist lives ‘now’, but is estranged from the ‘here’, because he lives ‘there’, conceptually, in the West.⁷

The main characteristic of the contemporary Arab discourse, he explains, is indeed this lost harmony between the ‘now’, with its past history, and the ‘here’, with its surrounding context. Muhammad ‘Abid al-Jabri also recognised the deep fragmentation and tension of the contemporary Arab consciousness that it portended:

The notions brought forth by the modern and contemporary Arab discourse neither reflect nor give expression to the current Arab reality; they are borrowed, most of the time, either from the European thinking – where they refer to a reality which has come into effect (or is in the process of coming into effect) – or from the medieval Arabo-Islamic thinking – when they had a true, specific content (or it was believed so).⁸

The product of this dilemma is the tram-lining of endeavour; the normal balances and checks of enquiry and evaluation in intellectual production – whether at the hands of the orthodox thinker or the moderniser – are jettisoned in favour of establishing, and keeping to, a trajectory characterised by *identity*. Objectivity and respect are the casualties.

The substitution of a fake modernity

Failing a commonly agreed mental vocabulary and method, each wing of the spectrum follows its own path, and in so doing perpetuates the quarantine of either. The ‘ancestor-worship’ of the orthodox and the Salafist, Lafif Lakhdar notes, demonises modernity as a heresy or imitation of Jews and Christians, and resorts to subconscious tricks to evade it:

The first is religious self-sufficient narcissism which considers itself in no need of any kind of self-renovation, on the pretext that “The first left nothing to the last” ... The second trick was adopted by most—if not all—Islamic reformers of the 19th century and is still to the present day advocated. It argues that we should renovate our thought so as to evade French modernity.⁹

The modernist wing indulges in a parallel remodelling, in which their modernity is no less artificial, since it is similarly impelled by an ‘identity.’ There is, according to Wael Farouq, a form of dynamism in this remodelling, but it is an illusory one that leads about in circles:

We are not facing two separated, or even conflicting, worlds, but rather a process of continuous remodeling, in which the two cultures merge into a special blend, giving birth to a “fake modernity”. By this I mean lifestyles, public views and behaviors that can neither be described as traditional nor as modern, but are a distorted mixture of both.¹⁰

The distortion comes about through an artificial construction put together from the historical legacy that is missing an essential, validating component: objective rational evaluation. The result

⁷ Wael Farouq, *Hats and Turbans, Adaptation to Modernity and Conventional Mind*, New York, 2012, p.17.

⁸ Muhammad ‘Abid al-Jābrī, *الخطاب العربي المعاصر: دراسة تحليلية نقدية* Markaz Dirāsāt al-Wahda al-‘Arabiyya, Beirut, 1992, p.182.

⁹ Lafif Lakhdar, *Moving from Salafī to Rationalist Education* (paper submitted to the *Conference on Modernity and Arab Modernity*, Beirut May 2004).

¹⁰ Wael Farouq, *Hats and Turbans*, p.18.

is a third culture, which relies on principles contrasting with those that have given rise to the emergence of modernity. This ‘fake modernity’

disfigures tradition as much as it disfigures the authentic manifestations of modernity. The best proof of this is the rejection of the rational dimension in both of them, i.e. the reason on which the Western modern civilization was founded and the reason at the basis of the Islamic heritage and civilization. On the contrary, “fake modernity” tends to lean on labyrinths of irrationality and on the exaltation of innate, instinctive feelings.¹¹

The polarising attractions of authenticity or rupture at a time of accelerated change has left the Arab world in a state of suspended animation, treading water in a fake modernity that paralyses their ability to indigenise the forces of creativity that the rest of the world – reconciled with modernity and generators of it – enjoy. The stresses of this change have also weighted the gravitational pull towards the authenticity prioritised by the religious discourse. As this discourse feeds the political institutions with their ideological vocabulary, its irrational ahistoricity in turn nurtures the rigid, irrational elements of heritage, while drawing from that heritage just those elements that nurture the formal, nonessential aspects of modernity.¹²

The question of ‘continuity’ and ‘rupture’

If the weight of the heritage is all-enveloping and sovereign, how is the impasse between cultural loyalty and cultural interchange, between continuity and rupture with the past, to be resolved? Given that reform necessarily entails a stressful change of mindsets and inherited cultural frameworks, it is vital, according to Hasan Hanafi, that the polarity between the two wings be removed “through maintaining a continuity between the old and the new, as opposed to allowing the kind of rupture between tradition and modernity.” De-alienating the vocabulary like this is the starting point:

Reform is a Qur’ānic term, where it appears ten times mostly in the sense of ‘reparation’ between men, or ‘restoration’ of the land (its least frequent meaning). It is a term accepted in common culture and, unlike the term ‘secular,’ is not a western import.¹³

This is where the reform initiative of the late 19th and early 20th century, the *Nahda*, failed: that phase took its starting point from social, political and economic structures rather than from inherited intellectual substructures. As a result these remained unchanged even as a liberal, western enlightenment-derived structure was superimposed upon them. Unsurprisingly the graft did not take.¹⁴

Dr. Sa’id Shabbār outlines the equilibrium required. “Cultural identities”, he explains, “serve as the people’s stoutest stronghold and fortress against perforation and total dissolution, even though they can be subject to negative influences, and some of its elements distorted and blurred.” Yet the energies invested in cultural loyalty must be balanced with a curiosity for the new, since

the culture that unites around its originating points of reference and in its practice opens up to, and embraces, all forms and aspects of life so as to engage and interact with the Other, is the one that is capable of living with, influencing and participating in creativity on both a regional and global level ... To the extent that a culture has an autonomous capacity for openness and dialogue, it contributes to the process of positive acculturation with other cultures.¹⁵

‘Rupture’ was actually built-in to early Islam

¹¹ Wael Farouq, *op.cit.*, p.19.

¹² Wael Farouq, *Ibid.*

¹³ Hasan Hanafi, ‘A manifesto for reform,’ *Almuslih.org*

¹⁴ Hasan Hanafi, *op.cit.*. For more on this theme see S. Ulph and P. Sookhdeo, *Reforming Islam, Progressive Voices from the Arab Muslim World*, Almuslih Publications, McLean, VA, December 2014, pp.209-212.

¹⁵ D. S. Shabbār, *الثقافة والعولمة، قراءة في جدل المحلي والكوني أو ظاهرة التثاقف* Vol. 25, July 2007, pp.159 and 165.

Progressive thinkers lament the unwritten formula that prevails: that the culturally loyal Muslim is to cancel the thought of the living and promote the thought of the dead, to the point of adopting the ‘reality’ of the past in order to illuminate present and future realities. To break this illusory formula of *past + present = future* the argument has to be made that ‘rupture’ has been a part of Islamic history, and that therefore the idea of breaking with tradition should not seem so jarring or alien. “Islam” as Riyadh Hammadi illustrated,

– the fashioner in ancient times of the resurgence of the Arabs – was the first to practice this type of rupture with the inheritance of the past. Not only that, it actually discredited this past by giving it the description of *jāhili* – ‘ignorant’.¹⁶

If the lamp of the past, as George Tarabishi writes, “shines in the darkened room but fades from view whenever one walks in the daylight”, the value of its paradigm can only be to illuminate where the failures occurred for the purpose of avoiding a repetition of them.

If any fusion with the past is to be entertained, this cannot be anything other than a fusion with elements of that past that evince *rationality*.¹⁷

The example of the ‘Golden Age’ of the High Islamic Civilisation is a demonstration of this cultural pluralism principle. As the effective centre of gravity in the world at the time, one that conjoined East and West in a seamless cultural bloc and created a cultural idiom global in its scale, Muslim civilisation from the 9th to 13th centuries was intellectually vibrant, productive, inclusive and expansive.

During the course of development of the Muslim *umma* into the High Islamic Civilisation characterized by the Baghdad Caliphate, influences from foreign cultures and the legacy of their intellectual endeavours fed into the mix. This was facilitated by the work of Indian, Persian, Jewish and Christian scholars who translated works from their various heritages, and the reception was enthusiastic, as typified by al-Kindī’s resounding endorsement:

It is fitting for us not to be ashamed to acknowledge truth and to assimilate it from whatever source it comes to us, even if it is brought to us by former generations and foreign peoples. There is for the student of truth nothing more important than the truth, nor is the truth demeaned or diminished by the one who states or conveys it; no one is demeaned by the truth, rather all are ennobled by it.^{18 ii}

The result was that in this period of self-confidence the literary and scientific production of the Islamic civilisation led the world. On reading the literature of that age it strikes us as refreshingly modern, with scientific and medical works, a literary body that included a strong strain of humanistic thought, works on geography, sociology, comparative religion and rational philosophy. This was the High Islamic Civilization which many Muslims today look back to as a source of pride.

However, the reality of the pluralism in the cultural productivity of the High Islamic Civilisation masks a problematic compartmentalisation of the intellect that prevailed. As Ibrahim al-Buleihi lamented, cultural arrogance prevented Arabs in early Islam from incorporating the knowledge of others into the core of their mentality:

Over the centuries the Arabs continued, and still do, to think that they possessed enough knowledge, that they had science and wisdom enough, and that they were not in any need of learning anything from others. This because they appeared on the historical stage as conquerors

¹⁶ Riyadh Hammadi, ‘The Nahda equation: between the past and the present.’ *Almuslih.org*

¹⁷ Riyadh Hammadi, *ibid*.

¹⁸ Al-Kindī, رسائل الكندي الفلسفية (*Al-Kindī’s Philosophical Letters*) Ed. Muḥammad Abū Rīda, Dār al-Fikr al-‘Arabī, Cairo 1950, p.103.

but not as learners, as teachers and not as students, those who give guidance rather than those who receive it.^{19 iii}

It was the failure to shed the charge that the philosophical endeavours of the major Muslim scholars were ‘interloper sciences’ (*‘ulūm dakhīla*) that prevented the cultural pluralism from enduring. While the symbiosis was tolerated the sciences could advance, but as soon as the formula of religious support for a divinely decreed state power became entrenched, re-establishing old habits from an age that pre-dated the blend, the narrowing intellectual space was given up to the more culturally ‘authentic’ textual sciences.²⁰

Under this pull of authenticity, cultural curiosity failed to take root among the readers of the Arabized texts. Works considered useful for the elucidation of Islamic truth were preferred, so that there was little or no consciousness of the broader cultural legacies of other traditions.²¹ Nothing was translated of the Greek literary heritage, its political theories (since these would entail the study of human-originated legislation)²² and, importantly, of its historiography. Nothing of the methodology of Thucydides nor the legacy of the historical record of antiquity was thus able to break the cultural orphanism that the Muslims imposed upon themselves.

Nor were the skills developed that might break this isolation. One of the signal errors of the High Islamic Civilisation is the failure to cultivate the knowledge of foreign languages, and the lack of interest in amassing and preserving the original texts. The antipathy to the ‘gibberish of the ineloquent foreigners’ is held by Muslim historiography to be an ancient aversion as a bulwark against imitating the infidel and all their ways.²³ Ibn Khaldūn explains the rationale in the *Muqaddima*:

[The Muslims] desired to learn the sciences of the [foreign] nations. They made them their own through translations. They pressed them into the mold of their own views. They peeled off these strange tongues [and made them pass] into their own idiom, and surpassed the achievements of [the non-Arabs] in them. The manuscripts in the non-Arabic languages were forgotten, abandoned, and scattered. All the sciences came to exist in Arabic. The systematic works on them were written in [Arabic] writing. Thus, students of the sciences needed a knowledge of the meaning of [Arabic] words and [Arabic] writing. They could dispense with all other languages, because they had been wiped out and there was no longer any interest in them.^{24 iv}

The enterprise of ‘deriving of benefit (*intifā’a*) from the works of the Ancients’ thus entailed the ‘peeling off’, the appropriation and digestion of these works, and their reconstitution in a new, often expanded and improved, form, but one that become the new ‘primary source of authority’ – so that the umbilical cord is severed and the dialogue with the past curtailed.²⁵

¹⁹ Ibrahim al-Buleihi, interview on *Al-Iḍā’āt* programme, December 2012. <https://www.youtube.com/watch?v=t5QfjBQpS1A> 19:04ff. Al-Buleihi goes on to explain how the persistence of this fantasy is causing problems for contemporary Arabs: “The world has changed and they still think that it is their duty to teach others, and that is the duty of others to listen to them. But they don’t have anything that they can teach others. This appalling fantasy, this sense of perfection, that others must learn from them, has rendered them incapable of benefiting from contemporary culture.”

²⁰ See S. Ulph and P. Sookhdeo, *Reforming Islam*, pp.157-9.

²¹ Al-Biruni in his *Tahqīq mā lil-Hind* is the illustrious exception that appears to prove the rule.

²² An exception may be considered the Muslim Hellenist Alfarabi’s analysis of Plato’s *Republic*, as featured in his work *كتاب مبادئ آراء أهل المدينة الفاضلة* (*The Book of the Principles of the Views of the Inhabitants of the Ideal City*). Translation by F. Dieterici, *Alfarabi’s Abhandlung der Musterstaat*, Leiden 1895.

²³ Ibn Taymiyya cites sources saying that the Caliph ‘Umar forbade the learning of the gibberish of the ineloquent foreigners (*lā ta’allamū raṭānat al-a’ajim*). Ibn Taymiyya, *Iqtidā’ al-Ṣirāt al-Mustaqīm*, Ed. Nāṣir al-‘Aql, D Ishbīliyyā, Riyadh, 1998, Vol. 1, p.511.

²⁴ Ibn Khaldūn *The Muqaddimah, An Introduction to History*. Edited by N Dawood. Translated by F Rosenthal. London: Routledge and Kegan Paul, 1967, p.432.

²⁵ Rémi Brague gives an interesting example of this ‘digestion’ process in the work of Ibn Sīnā, whose encyclopaedic work *Kitāb al-Shifā’* effectively replaced Aristotle so that “in the Muslim Orient, Aristotelianism quite simply became Avicennism”. Rémi Brague, *Eccentric Culture: A Theory of Western Civilization*, St. Augustine’s Press (October 2002), p.108.

The effect of this was that the act of going back to the sources to reinterpret them became impossible in the Islamic world. In addition, the overwhelming domination of Arabic, and the assumption of its essential superiority as a language, made it impossible for anything resembling the sophisticated linguistic scholars of Europe to emerge. Even today the knowledge of comparative philology is very limited among the Middle Eastern scholars of Islam, and among the more orthodox-minded scholars the urge to prevent cultural contamination still motivates an outright ban on the learning of foreign languages, in conformity with the standpoint of the Ancients.^{26 v} As Rémi Brague argues:

the Islamized world made the phenomena of ‘renaissances’ impossible – that is, of a return to the original texts against the traditions that claimed to follow them ... [whereas in European history] one witnesses a constant effort to go back up toward the classical sources. One can thus describe the intellectual history of Europe as an almost uninterrupted train of renaissances.²⁷

European culture whether profane or religious, Brague explains, acknowledged in itself a ‘cultural secondarity’ status, as if a pedigree of ideas outweighed anything that a mere pedigree of lineage could offer:

In the religious domain as in the cultural domain, Europe had the same relation to what preceded it: it did not tear itself from the past, nor did it reject it. Europe did not pretend, as to profane culture, to have absorbed in itself everything that Hellenism contained or, in religion, everything that the Old Testament contained – in such a way that one could throw away the empty shell.²⁸

There was nothing anything akin to the rationale illustrated by Ibn Khaldūn whereby absorption and appropriation (without attribution) of earlier achievements rendered their authors redundant. One of the signal dangers of this ‘absorption’ is projection and distortion, taken to the point of re-scripting history and delegitimising the chain of transmission in ideas. Under this scheme the Jews and the Christians tampered with the texts of revelation that were transmitted to them:

It follows, for the Islamic religion, that the truth of Judaism, as well as that of Christianity, is found within [Islam] itself, and in it alone. This truth is situated therefore outside the two religions that have preceded it and that are thus alienated from themselves. In consequence, their study has no intrinsic interest. Now, everything happens in the Muslim world as if the same model had been applied to the anterior or external civilizations.²⁹

In this refusal of cultural secondarity, Islam is now made to be purportedly the ‘primordial’ civilisation. In Europe, on the other hand, there was no space given for a destructive concept of *jāhiliyya* to delegitimise anything which preceded its contemporary Christian identity, nor indeed that which stood contemporary to it. Nothing, that is, that equates to Taqī al-Dīn al-Nabahānī’s confused conception of the unalloyed ‘mentality of the faithful’.³⁰ In European intellectual history, medieval or early modern,

the effort of returning back aims at something other than the cultural recoveries and religious revivals that traverse every civilisation. This effort does not tend toward the primitive period; it is not a return toward what is proper to the culture and which would have existed in all its purity at

²⁶ The *fatwa* issued by Nāṣir bin Sulaymān al-‘Umar in March 2009 against the learning of the ‘babblings of the foreigners’ (رطانة (الأعاجم)) is indicative of the standpoint: “For this does not stop at the learning of the language and the letter, but oversteps the mark towards admiring, imitating and studying their cultures that contradict the guidance brought us by the Prophet. This among other things is its patently negative effect.”

²⁷ Rémi Brague, *Eccentric Culture: A Theory of Western Civilization*, St. Augustine's Press, October 2002, pp. 106 and 114.

²⁸ Rémi Brague, *Op. cit.*, p.111.

²⁹ Rémi Brague, *Op. cit.*, p.112.

³⁰ The writings of Taqī al-Dīn al-Nabahānī typify the confusion caused by the *jāhiliyya* pre-occupation: “The Muslims themselves were not affected by any other culture, neither in terms of their way of thinking or in their understanding of Islam. The mentality of the Muslims remained a pure Islamic mentality.” Taqī al-Dīn al-Nabahānī, الشخصية الإسلامية (The Islamic Personality) Part One, Hizb al-Tahrir Publications (Beirut, Dar al-Umma, , 6th ed. 2003), pp.273-284.

the time of the founding origins. On the contrary, it tends toward a source located *outside* of European culture – in this case, in Greco-Latin antiquity.³¹

The sizeable, and growing, literature by European scholars casting light on the achievements of medieval Muslim science and philosophy demonstrates that the curiosity is widely focused, and proves the inaccuracy of the charge of exclusive ‘Eurocentrism’ in the Westerners’ perception of history and civilisation. The intellectual curiosity of western scholars has been too deeply wired in to configure a doctrine of ‘cultural contamination’. Europe thus never considered itself its own source, and did not become culturally orphaned. What is more, a conspicuous by-product of this curiosity manifests itself in self-criticism, expressed not only in reflective analysis but raised to the state of a literary genre of seeing itself through the eyes of others.³² “I discovered that the West didn’t build itself except as much as it has criticized itself”, observes George Tarabishi,

The Western mindset became prevailing and its culture global when it indulged in a process of self-criticism. But we, who possess a bequeathed heritage that is no less important or sizable than that which the Western intellectuals inherited, will not be able to continue the process of modernization and attain the required renaissance unless we perform the same process to which the West has subjected itself. We will not be able to compete in the struggle for modernity shorn of true criticism.³³ vi

One can see here the essential difference from the situation in the contemporary Middle East. Here the space for reflection on the achievements of earlier minds remains stubbornly mono-cultural. Where not sullenly accusing the Other of insufficient recognition of Islamic primacy, reflection on the past has an altogether different purpose: the magnification by the orthodox-minded of the authenticating model of *al-Salaf al-Ṣāliḥ*, the ‘pious ancestors’. Their perceptions must be what subsequent generations must perceive, and to what they did not know, one must not venture to add. The problem this brings is the gamble that cultural ‘authenticity’ movements of this ilk make against exhausting their internal resources.

If the concept of *jāhiliyya* is symptomatic of a reticence to self-examine, the question then poses itself: Why does the reticence to self-examine and review occur? Ibrahim al-Buleihi, a prominent campaigner for a ‘secondary status’ for Islam too, has given long thought to this problem, motivated by a sense of urgency that, without a comprehensive reflection on the internal mechanisms of progress and their intrinsic value – as opposed to appropriating the products of these mechanisms – Arabs are marching out of step with the rest of the world.

He sees the problem in terms of humanity’s common mental programming that is by default defective, whereby the *tabula rasa* dispositions at birth spontaneously develop in a disorderly manner, conditioned by the immediate environment, to form a particular kind of mentality. But importantly, among the Arabs, he notes that this default position has yet to recognise the qualitative departure that has occurred in human cognition. “One idea with important implications that is being put about”, he observes,

is that civilisation is some form of ‘spontaneous’ accumulation, but that is not true. Backwardness is a spontaneous accumulation, ignorance is a spontaneous accumulation, defects are a spontaneous accumulation, but positive things never come about spontaneously. Correct information is obtained not spontaneously but rather through verification, through hard, continuous work. Nothing positive can affect your mind or your person spontaneously. That which

³¹ Rémi Brague, *Op. cit.*, p.122-23.

³² Examples of this genre are legion: Montesquieu’s *Persian Letters*, Cadalso’s *Cartas marruecas* (an examination of Spanish society through the eyes of a young Moroccan), Montaigne’s essays on the American Indians, Goethe’s *West-Ostlicher Diwan* (a symbol for a stimulating exchange and mixture between Orient and Occident).

³³ George Tarabishi, أين نحن في العالم؟ متى ينتهي الانحدار؟ (‘Where are we in the world? When will the regression end?’) interview with *Al-Hayāh* newspaper - January 30th 2006.

does come spontaneously, those things you are programmed towards spontaneously – are always defective.³⁴

The modernity / West conundrum

That qualitative departure he identifies as an infrastructure to global modernity that is not spontaneous, but has a specific origin. “In my childhood”, he explains,

I recognized that there was a huge gap not only between us as Arabs and Muslims, but between all the nations on the one hand, and the West on the other. The West, and no one else, is the architect of this eminent civilization that is qualitatively different from everything that humanity has known throughout history. The evolvement of the nations that tagged along was proportional to what they were inspired by from the West.³⁵

As the mental idiom of western civilisation spread inexorably across the globe, Muslim reformers have long stressed the need for a reconciliation with western culture and, starting from the reform initiatives of the early 20th century, sought a symbiosis with it that safeguarded indigenous, Islamic cultural markers. In the 1980s Hussein Ahmad Amin noted the enduring sense of dislocation felt by many Muslims, and argued that Muslims should feel relaxed about this reconciliation,

for there is nothing there that prevents adopting things from Western material civilisation subsequent to its being subjected to an Islamic spiritual colouring ... It is good that Islamic society today takes from western civilisation all its sciences and experimentation in manufacture, agriculture, trade, medicine, engineering and other disciplines, in an unfettered and unconditional way, all the while preserving its spirituality that colours this science and steers it towards the benefit of mankind.³⁶

Contemporary scholars and reformers, however, argue that something more than that is required: an in-depth analysis of the mechanisms that brought about this advance in the first place. A new discipline, Hasan Hanafi argues, should be formed

so that we may see the West as a subject of study and not merely as a source of science. It means initiating a new discipline of Occidentalism – as a complement to Orientalism. It means undertaking an unfiltered investigation of reality, viewing it and analyzing it directly without recourse to the mediatory role of the Text, so that reform turns the culture of interpretation into a culture of the direct examination of the world as it is.³⁷

The ‘Occidentalism’ endeavour which Ghassān Salāmé, as we saw, wrote off as ‘laughable’ compared to the exhaustive efforts of western Europe to understand the deep intellectual infrastructures of the Middle East, is a vastly more important exercise than Orientalism, for it has major implications for the future of the Arab world.

The principles underlying the West’s success at knowledge acquisition, rather than the accumulated body of the knowledge, have to be the focus of the endeavour. “Western societies have for centuries proceeded along an uninterrupted path of modernisation”, Mohamed Sanduk

³⁴ Ibrahim al-Buleihi, *World Government Summit*, February 12th 2017. Breakout Session, <https://www.youtube.com/watch?v=uuloGXCDz7c>, 15:40-16:31.

³⁵ F. S. Shogiran, Saudi intellectual: Arabs block civilization, *Al Arabiya* 20th November 2016. <https://english.alarabiya.net/en/News/gulf/2016/11/20/Saudi-intellectual-Arabs-block-civilization.html>. Al-Buleihi expanded on this theme in a television interview for the *Al-Iqā’āt* programme: “The prosperity that has occurred has been made by the West. Even Japan recognises that had it not benefited from the West it would not have prospered ... in all things: on the value of a human being, his freedom, the preservation of his dignity, in the development of science, the development of technology, the development of life, do you see life now being like the life of 10 centuries ago? All these huge changes were made by the West ... All countries today that have emancipated from backwardness and have made the leap forward towards this civilised advanced society, have derived all of this from Western culture and not from their own ancient cultures. Ibrahim al-Buleihi, *Al-Iqā’āt* interview, 9:29 and 10:23ff.

³⁶ H.A. Amin, دليل المسلم الحزين إلى مقتضى السلوك في القرن العشرين (‘*A Guide for the Sad Muslim to the Behaviour Required in the 20th Century*’), Reprint: Kotobarabia, 1983, p.23.

³⁷ Hasan Hanafi, ‘A manifesto for reform,’ *Almuslih*.

observes, “so the Western experience must be studied and the beneficial experiences that led to the age of the Renaissance duly drawn from it.”³⁸ Scholars of the history of science conventionally focus on one event in European history to mark the point where the scientific enterprise took off. “If we go back to European history”, Ibrahim al-Buleihi observes,

we find that the real beginning for European progress was Copernicus's discovery that the Earth wasn't the centre of the universe but just one of many planets floating in space. This was the one piece of information that changed people's perception about the world and shook many beliefs in their minds. It made them reconsider their perceptions.³⁹ vii

What marks this event as crucial, they argue, is the boldness of the challenge to conventional, and indeed, doctrinal, wisdom that Copernicus' book *De revolutionibus orbium coelestium* (*On the Revolutions of the Celestial Spheres*) represents. “To accept the conventional dating of the beginning of modern science”, the English philosopher A.C. Grayling concedes,

is not to withhold credit from the advances in science, mathematics and technology in the period from classical antiquity until the mid-sixteenth century, for there had most certainly been much of all three, mostly in India, the Middle East and (especially) China. Discoveries in these times and places were relevant to the rise of science in the sixteenth and seventeenth centuries. So too was the development of instruments.⁴⁰

But the operative element was the ensuring of independent research and confirmation as a principle superior in value to the prestige and heritage of the ancestral sage. It was this element, practised with growing confidence in the century following Copernicus, that constituted

the distinctive departure that made the scientific revolution. Employment of an empirical methodology and quantitative mathematical techniques allowed the later Renaissance's enquirers to challenge the hegemony over thought not just of the ancient writers but – more importantly still – of religious orthodoxy.⁴¹

The system and its methodology was all-embracing and inexorable in its rupturing leverage on orthodoxy, as demonstrated by Newton's concerns to leave a loophole for ‘divine intervention’ to maintain the stability of the system that he was uncovering in his *Philosophiæ Naturalis Principia Mathematica*.⁴²

A concentration on method, over against accumulation, is therefore the most important feature of a reformed pedagogy. And conspicuous among the constituents of this ‘method’ is the philosophical defence of criticism and review, along with the demotion of the status of the scholar from the ‘sage’ (*al-ḥakīm*, *al-'alīm*) to one of a more humble state:

Science is the work of many hands ... together they represent the collegial, mutually critical, peer-reviewing, competitive and collaborative community which built a new understanding of the world.⁴³

This readjustment, this conception of a collaborative enterprise took shape in the seventeenth century and led to an acceleration in scientific thinking of a different order from what had gone before and justifies the name of a ‘revolution’. From this approach flows everything that has been achieved ever since as much in the field of science as in the applications of this scientific approach in the realms of governance and law.

³⁸ M. al-Sanduk, *Intellectual distortion and societal suicide*, *Almuslih.org*

³⁹ Ibrahim al-Buleihi, *World Government Summit*, 13:16ff.

⁴⁰ A.C. Grayling, *The Age of Genius, The Seventeenth Century and the Birth of the Modern Mind*, Bloomsbury Publishing, London & New York, 2016, p.232.

⁴¹ A.C. Grayling, *Ibid.*

⁴² See J.D. Bernal, *Science in History, Vol.2: The Scientific and Industrial Revolutions*, Penguin, London, 1969, p.487.

⁴³ A.C. Grayling, *Ibid.*

In calling for a pedagogy that seeks to apply the experience of Europe and the West to the Muslim Middle East, educationalists inevitably come up against criticisms of promoting something amounting to ‘cultural disloyalty’. But as Ibrahim al-Buleihi underlined earlier, while modernity takes the West for its cradle, the pace of its development over the past centuries and its global spread renders that criticism irrelevant. Modernity, in its break with the cultural traditions and heritage of centuries, constitutes a qualitative change in civilisation, and can no longer be described as a single culture appropriate for some regions and not for others. In the same way that Greek philosophers, to whom westerners look back to as their originators, promoted through their challenges a rupture with their heritage, so does modernity detach itself from its own cradle.⁴⁴ It has broken down the barriers of time and space to become a universal phenomenon so that it emerges “in the form of institutions, which are independent of the cultural, geographical and national contexts”.⁴⁵

This can be demonstrated by the fact that the transformative mechanisms of modernity can be as much a mystery to westerners as to non-westerners. “The power of societies in which the modern world-view has become the driver”, A. C. Grayling maintains,

means that even though most people in the world, and most of the time since the seventeenth century, have in some sense remained pre-modern in mind-set, they are holders of what is in fact a functionally marginal view.⁴⁶

Once it is established that modernity is not ‘western’ in essence’ but only in historical, geographical origin, there is no place for an adversarial relationship in the process of adopting it. Modernity is not ‘Christian’ or ‘western’ but simply “the direct examination of the world as it is”. “The Arab individual does not have to be a rebel,” argues Ibrahim al-Buleihi,

but he must research for the truth, that he does not cancel out his self and dissolve himself in the herd. This is important, that he be an individual capable of independent thought - this does not mean that he rebels against his society, but that he thinks in a way that will benefit his society, not in a way that is a copy repeated from others⁴⁷ viii

Al-Buleihi’s observations are all the more cogent in a climate where “the chorus of anti-reason has become cacophonous against imitating the West”, as Lafif Lakhdar argues. The problem is a failure to understand history, and in particular the course of the struggle for scientific and technological mastery that this history has illustrated:

There has never been a nation that has entered onto the phase of scientific, technological or intellectual innovation without first passing through a stage of imitating western science and technology. China could not have achieved today, in two decades, the economic progress that Britain made over a period of two centuries, without imitating the West. The same goes for India and the Asian ‘Tigers’ – having learnt, just as a child does, by imitating his parents and teachers before progressing onto a stage of being independent from them, and even surpassing them.⁴⁸ ix

There is no call for a sense of inferiority here, since the process is active not passive, and does not constitute a surrender to a competing culture, but rather constitutes an alignment with the *universality* of the results that have been achieved and promoted in the West:

Just as a good translation is an act of *participating* in the creativity of the author, similarly a conscientious imitation of Western thought and science is in fact an act of active participation in

⁴⁴ This is true conceptually while, of course, the statistical progress of scientific endeavour may still be seen as an outgrowth of conditions that are more prevalent in western states, such as the promotion by democratic governance of research endeavour, its institutionalisation and independence and the free access and interaction of scientists, among other factors.

⁴⁵ ‘Abd al-Latif Sā’if, ملاحظات حول الحداثة في الخطاب العربي المعاصر Al-Mustaqbal al-‘Arabī, n.146, 1991, p.146.

⁴⁶ A. C. Grayling, *op.cit.*, p.322.

⁴⁷ Ibrahim al-Buleihi, *Al-Idā’āt* interview, 7:00-7:28.

⁴⁸ Lafif Lakhdar, الميثاق العقلاني (‘The Charter of Rationality’) *elaph.com*, November 19th 2007. <http://elaph.com/Web/ElaphWriter/2007/11/281513.htm>.

scientific, technological, epistemological and cultural discovery ... The prohibition on imitating the West is thus a form of racism against the self, an act of suicide.^{49 x}

The task of educationalists, then, is to indigenise ‘rupture’ with inherited patterns of thought and naturalise it as *an integral and constructive constituent* in culture. If ‘education’ is understood as the process of educating the student in the body of received opinion it will remain a passive exercise that inculcates passivity. ‘Education’, in this sense, cannot develop or promote change:

Societies don't teach anything that changes them, they teach what they believe in and they instil the interests, values and perceptions that they inherited. It is therefore a big mistake for people to wait for ‘education’ to free them from ignorance. ‘Education’ never frees societies from ignorance, it actually establishes ignorance. For example, if it hadn't been for ‘education’, ISIS would not have come to life, neither would have Al-Qaeda or Boko Haram. These are products of ‘education’.^{50 xi}

Information inculcated at the school or university has to be not merely ‘learnt’ but the sinews of its acquisition – in addition to its results – added to the central structure and where necessary change that structure. Anything else is an act of quarantining:

That is why you find people studying at the same university from different cultures and they all succeed in their field. They all go on to become good doctors, skilful engineers or other things. But when it comes down to the mental structure on which they were programmed as children, they are the same as their illiterate parents.^{51 xii}

The process of turning the mind from a receptacle into an effective, critical thinking tool therefore requires a form of controlled shock, to jolt the student's mentality out of its ‘default fossilisation’. For Ibrahim al-Buleihi the enemies of emancipation and progress lie to either side of this rupture process: the stasis of inherited cultural norms or the reliance on the illusory ‘spontaneity’ of the human brain.⁵²

The mind needs to be deconstructed and then reconstructed again because it was built spontaneously. So if you want to build it in a real, scientific way, you must deconstruct it and then reconstruct a new mind.^{53 xiii}

The idea that progress is made by breaking with the past, by rejecting and questioning, is not a self-evident one but it is certainly not untested. Paradoxical as it may appear, history (as we have seen) demonstrates this break with history in the ‘critical displacement of existing models’ undertaken by the ancient Pre-Socratic philosophers of Ionia, most likely under the influence of Near Eastern science.⁵⁴ Ancient Greek historians and philosophers noted the relationship of tradition-breaking innovation and prosperity⁵⁵ and the transforming power of the break was repeated at the onset of the High Islamic Civilisation. In the thirteenth century, as we shall see, this ‘rupture’ was repeated once again in the classrooms of Europe.

⁴⁹ Lafif Lakhdar, *ibid.*

⁵⁰ Ibrahim al-Buleihi, *World Government Summit*, 5:27ff.

⁵¹ Ibrahim al-Buleihi, *Ibid.*

⁵² “The measure of progress – I always say this – is the ability to change. If we are teaching our generations to resist change, that means we are resisting progress too ... Leaving the mind to run spontaneously is like having a hole in the ground, a hollowed part of the ground, where everything carried by the wind ends up.” 11:10ff and 20:38ff.

⁵³ Ibrahim al-Buleihi, *op.cit.*, 25:36ff.

⁵⁴ For a full treatment of this see Geoffrey Lloyd, *The Revolutions of Wisdom: Studies in the Claims and Practice of Ancient Greek Science*, Berkeley, University of California Press, 1987.

⁵⁵ An ancient Corinthian contrasted Spartan conservativeness unfavourably with Athenian innovativeness, arguing that “what supervenes necessarily wins out” (*Ἀνάγκη δὲ ὥσπερ τέχνης αἰετὰ ἐπιγινόμενα κρατεῖν* - Thucydides, *Peloponnesian War* I, 71) and Aristotle averred that “all men seek the good rather than the traditional” (*ζητοῦσι δ' ὅλως οὐ το πάτριον ἀλλὰ ταγαθόν πάντες* - Aristotle, *Politics* II, V, 12).

The perils of an ‘epistemological exception’

As the pace of knowledge development continues to increase exponentially, with the number of annual PhD papers doubling every decade, and the number of scientists alive in the world doubling every 18 years,⁵⁶ the perils of educational stasis have never been more imposing. The instinct to preserve from contamination remains too dominant, and is draining the Muslim world of its energy to adapt and keep pace with the changes that are being forced upon it.

The stasis is not helped by the culturally narcissistic claim to a form of ‘Arab exceptionalism’, not only in the realm of politics (where the term has become common) but also in that of the mind. If biological investigation into the cognitive brain, as the seat of reason and all complex rational activity, simply confirms what rational philosophy since Plato and Aristotle has maintained up to now – that the human intellect is identical and universal – any claims to mental disparity or difference on the basis of cultural affiliation or racial classification must be illusory. Thus Lafif Lakhdar dismisses the thesis on the particularities of ‘the Arab mind’ proposed in Dr Muḥammad ‘Ābid al-Jābrī’s series on *Al-‘Aql al-‘Arabī* as an ‘epistemological delirium’:

The multiplicity of rationality according to the multiplicity of cultures, as claimed by al-Jābrī, has brought with it catastrophic epistemological results: the denial of the existence or even the possibility of the existence of universal scientific rules or universal knowledge – something that Ibn Rushd in his commentary on Aristotle’s *Metaphysics*, the *Talkhīṣ mā ba’d al-Ṭabī‘a*, affirmed: “As for Reason, it grasps its forms from created matter, but conceives of them in the same way, this is self-evident and it is through this that it understands the quality of things; otherwise there would be no sciences at all.”⁵⁷ xiv

If every culture had a rationality specific unto itself, Lafif Lakhdar argues, the exact sciences could not exist since they are the product of the intellect *par excellence*, which is itself the product of a shared, rational, mutual understanding amongst members of a geographically disparate scientific community. If the universality of the reasoning mind that crosses cultures is denied, mankind is forced into some “delirious Tower of Babel”, where the number of rationalities and sciences equals the number of cultures and ethnicities. Yet reality, as it is lived, flatly denies this:

For in Morocco or China the student studies the same mathematics and the same medicine. Muslim *fuqahā’* in their dealings have adopted Roman Law which has been transformed into customs and traditions in Egypt, the Levant and North Africa in the same way that the Muslim *mutakallimūn* translated the Greek word *logos* as ‘*ilm al-kalām*’ and borrowed the terminological vocabulary from Aristotle’s works on logic; in the same way the Arab and Muslim philosophers incorporated into Arabic many of the Greek philosophical terms without translating them and did not – as opposed to al-Jābrī – take as pretext the particularity of Islamic culture as a reason to prohibit themselves from adopting what universal Reason in Rome and Athens had achieved.⁵⁸ xv

What is more, there is an equation between places of religious strife and those parts of the world where the functionally marginal pre-seventeenth-century mindset – shielded from updating itself by the claims to an exceptionalism – remains dominant. The mental fossilisation and mental totalitarianism of the Arab Middle East has now become the paradigm for this dominance. “Why are we trailing behind the rest of the world?” Ibrahim al-Buleihi asks,

Why do we find that all the wars and violence are now an Arab, Islamic product? It is because we are living outside of the course of history, we are living outside the human system ... What can we expect from a mind that’s being incited day and night to be fossilised, how can we expect any good from this?⁵⁹

⁵⁶ Eric Gastfriend, ‘90% of All the Scientists That Ever Lived Are Alive Today’, *Future of Life Institute*, https://futureoflife.org/2015/11/05/90-of-all-the-scientists-that-ever-lived-are-alive-today/#_edn2

⁵⁷ Lafif Lakhdar, *Op. cit.*.

⁵⁸ Lafif Lakhdar, *ibid.*

⁵⁹ Ibrahim al-Buleihi, *op.cit.*, 5:27ff and 11:10ff.

Two observations sum up the perils of the epistemological detachment that the failure of education in the Middle East has bequeathed. “The active reassertion of the old stories and beliefs,” notes A.C. Grayling,

is underway in parts of the world where they never fully or even partially lost their hold Thus humanity is in a bottleneck of contradictions, a moment of peril, as the new mind outstrips the old mind so far that the old mind is trying to pull the new mind back, even trying to extirpate it, yet using its discoveries in a severity of self-contradiction that approaches madness.⁶⁰

That the Middle East stands at the fulcrum of humanity’s destiny was underlined, in a more graphic presentation of the ‘bottleneck’, by Sayyid al-Qimny at a conference in Brussels in May 2016: “As for our location in space-time,” he concluded:

we are standing in between two eras: the first is 175,000 years old, from a time when humans first walked on two feet from Africa out into the rest of the world. These humans continued to think in the same way until the appearance of scientific approaches to thought in the modern age, until the appearance of John Locke, Voltaire and the like. Now, in this very era, this same type of thought – and those who practise it – still refuse to give up its existence. It is a past era which refuses to pass away. Indeed, it is fighting to bring some of its space-time back into our countries that are aiming to develop ways of exiting the bottleneck, the black hole that is blocking our way from attaining the goal on the horizon that your western countries have attained. Your [European] lands managed to pass through the black hole, but the black hole is still there blocking us in this backwards-heading space-time. It wants to swallow us up, but the swallowing will also engulf those of you who have attained that goal on the horizon, and will return you back into that black hole again! It is a war between two different eras. And we are the ones standing in this space-time between these two eras.^{61 xvi}

⁶⁰ A. C. Grayling, *op.cit.*, pp. 323-4.

⁶¹ Sayyid al-Qimny speaking at the ADHOC convention “The Roots and Causes of Islamic Violence,” held in Brussels on May 22 2016. <https://www.youtube.com/watch?v=WPnL5xPEPac> 2:10:37 – 2:12:20.

METHOD: The promotion of comparative cultural study on the development of science

Given the current state of impasse that education in the Middle East suffers from, and given the patent success of an existing alternative educational system for the promotion of a knowledge society, logic dictates that a new curriculum will need to include a study on that system and the historical events and directions taken that have produced that success.

By instituting a module of *comparative cultural studies* the focus will be on determining for the student the *mechanisms* for the success, rather than simply their historical sequence. How was it that Europe succeeded where other cultures failed? What was the balance that Europe made between heritage and innovation, and between the religious and non-religious world view?

In making this inclusion there are other benefits that will accrue from the exercise:

- The establishment of the existence of a *moral / ethical underpinning* to modernity and pluralism;
- The establishment of the existence of an *intellectual / philosophical underpinning* to modernity and the knowledge society;
- The tracing of the cultural and religious parallelism between the Islamic and Christian worlds in the factors that militated against, or promoted, the scientific resurgence;
- The consequent demonstration of the *cultural neutralism* of modernity and the irrelevance of cultural narcissism, as opposed to a perception of a 'Judeo-Christian' epistemology set in opposition to an 'Islamic' epistemology.

The task is one of some urgency since, as Nidhal Guessoum professor of physics and astronomy at the American University of Sharjah underlines, practically no philosophy of science is taught in schools and universities of the Arab-Muslim world, and that this deficit "is the essential reason for the existence of a very skewed understanding of the relation between science and religion generally, and Islam in particular, among most Muslims." He argues that if the Middle East is to see the arenas of science and technology thrive, the priority for the educational sector is to understand the need to

engage in a serious dialogue with the Muslim theologians and scholars and convince them that science today has much to say on topics that they have monopolised for too long, the need to educate the public on science issues that are rather closely related to the religious debate, and finally the need to link with non-Muslim thinkers who have developed expertise in the field of science and religion.⁶²

One of the prerequisites of this dialogue is the 'historical dimension' which he sees as important in two principal arenas:

(1) we need to correct much misinformation that circulates within the Muslim culture both in the West and in the East about what was achieved during the "Golden Age"; and (2) we need to examine the way science was then related (or not) to Islam, whether scholars looked in the Qur'an for information and direction or not, whether they (implicitly) adopted a form of methodological naturalism, whether they understood the laws of nature (God's laws) as immutable or not (they always apply or they "usually" apply), and so on.⁶³

It is therefore essential that the ambiguities and misconceptions are cleared up, and one of the most effective means of doing this is to make the case – via a process of comparison between the

⁶² Nidhal Guessoum, *Islam's Quantum Question: Reconciling Muslim Tradition and Modern Science*. I.B. Tauris, London 2011, section 'Educational and Social Issues'.

⁶³ Nidhal Guessoum, 'Islam and Science: The Next Phase of Debates', *Zygon: Journal of Religion & Science*, Vol. 50, Issue 4, December 2015, p.870.

experience of two cultures historically engaged in negotiating the relationship of science with faith and heritage – for the culturally neutral nature of modern methodologies of accumulating and evaluating knowledge.

Once these conceptual barriers are removed, the path is cleared for the dismantling of the cultural and intellectual quarantines. This achieved, the module can then proceed onto the justification and demonstration of the ‘scientific method’ as it underpins not only the physical sciences, but its broader application in the realm of law and governance.

The emergence and fading of Islamic science

Factors contributing to the efflorescence of Islamic science

When historians look back at the period of the High Islamic Civilisation and its achievements in the early medieval period, they highlight a number of operative factors that led to a period of conspicuous scientific achievement. Prominent among these factors is the comparative lack of cultural quarantining that the Islamic world witnessed during that period. “The inclusion of the knowledge of other countries” writes the historian of science J.D. Bernal,

gave Islamic science a distinct advantage over that of classical times. Not only were the Arabs able to make use of the Mesopotamian astronomical and mathematical tradition, which had continued unbroken since Babylonian times, but they consciously used the ancient knowledge of India and to a lesser extent that of China.⁶⁴

The geographic expansion of the Islamic world, and within it the primacy of one language – Arabic, united scholarly endeavour in a single linguistic idiom, a fact which equally facilitated the development of a common intellectual idiom. One direct beneficiary of this was the acceleration in knowledge of the lands that came under its sway, so that,

[Arabs] were able to add to the knowledge of the Greeks to such an extent that they laid the foundation of the modern geography of Asia and North Africa. This they owed to the wider range of the Islamic world and the decentralisation of its culture – for learned men were to be found from Fez to Samarkand – and to the long journeys that were undertaken by traders and pilgrims to Mecca.⁶⁵

The results can be seen in such signal works as al-Bīrūnī’s *Tahqīq mā lil-Hind*, as mentioned earlier, and endured even in areas subsequently lost to the Muslim world, such as Norman Sicily, where Muḥammad al-Idrīsī’s geography known as the ‘*Book of Roger*’⁶⁶ (after the Norman king Roger II who commissioned the work) continued to impress with its accuracy centuries after its appearance in 1154. This international perspective aided the progress and intercommunication of a body of learning that could draw from the wells of Greek, Persian, Indian and even Chinese thought, and was responsible for some notable developments and improvements upon earlier achievements such as occurred in the fields of algebra and trigonometry.

But historians of science also point to some tantalising splashes of significant innovation and paradigm shifts in learning that took place during the period of the High Islamic Civilisation. Among the considerable achievements of this period, they focus on some notable arenas of endeavour which relied specifically on experimentation rather than inherited assumptions. Such endeavours are significant to a consideration of the methodology of science since, by establishing the primacy of inductive experimental method, and the employment of hands-on, artisan skills, they overturned the scholarly consensus. These works include the study of optics, which Ibn al-Haytham’s resolution, by personal study and experimentation in his work *Book of Optics* (*Kitāb*

⁶⁴ J.D. Bernal, *Science in History, Vol.1: The Emergence of Science*, Penguin, London, 1969, p.275.

⁶⁵ J.D. Bernal, *Op.cit.*, p.277.

⁶⁶ The full title is *نزهة المشتاق في اختراق الأفاق* (*The Recreation of the One Who Longs to Pass Beyond the Horizons*) or *Tabula Rogeriana* in Latin.

al-Manāẓir) of the long disputed theories of ‘intromission’ and ‘emission’ in favour of the former, effectively placed it on a scientific footing in the modern sense of the term.⁶⁷ They include also the numerous endeavours of Arab Muslim scholars in the field of chemistry, where a similarly hands-on, empirical approach to a formerly theoretical science lent paradigm-shifting originality to their work and ensured significant advances. “On reading Islamic scientific works of the period”, Bernal concludes, “one is struck by a rationality of treatment that we more readily associate with modern science”.⁶⁸

The character of Islamic science was continuity, not revolution

Such things portended well for the Islamic world to develop science and technology and maintain the lead. But the fact that this lead was not maintained, and the momentum lost altogether to Christian Europe, needs to be explained to the contemporary student as something more than an accident of history or a product of economic or political decline, but rather as *a manifestation of a conceptual and methodological deficit*.

One of these deficits was undoubtedly an over-heavy reverence for tradition, which affected the embryonic scientific scholars as much as the doctors of law. For the scholars of the Islamic world, on the whole, were products of their time, and lived in the shadow of the achievements of the Greco-Roman world, content to accept and codify the late classical pattern of the sciences and add to the weft, rather than refine or revolutionise it. As al-Biruni put it:

We ought to confine ourselves to what the Ancients have dealt with and to perfect what can be perfected.⁶⁹

In conformity with this perception, Arab scholars carried on the Ptolemaic system of astronomy through their studies of the *Almagest*⁷⁰ and compiled authoritative treatises and commentaries on medical works of Greek forerunners,⁷¹ of considerable value and at times adding significantly to the store and correcting errors, but not altering the scientific paradigm. The continuity of the Hellenic science that the Arab Muslim scholars preserved and augmented is considered to have been of value as one of the two external stimuli that accelerated the emerging recovery of western Europe that had been taking place since 1070⁷²: the first – Islamic – stimulus acting chiefly in the twelfth-thirteenth century and leading to the broadening of scholasticism, the second – Byzantine – stimulus taking place in the fifteenth century and powering the expansion of learning of the ‘Renaissance’ period.⁷³ During this period the large scale translation and editing enterprise of

⁶⁷ Though this work was largely ignored in the Arabic world it was anonymously translated into Latin around 1200 A.D. and further summarised and expanded on, making the work of Ibn al-Haytham (‘Alhazen’) a standard text on optics in Europe for the next 400 years.

⁶⁸ J.D. Bernal, *Op.cit.*, p.271.

⁶⁹ J.D. Bernal, *Op.cit.*, p.273.

⁷⁰ From the Greek μέγιστη ‘Greatest’, from the actual title Ἡ Μεγάλη Σύνταξις (‘The Great Treatise’) the *Almagest* was a Latin re-translation made in the twelfth century from an Arabic translation, which would endure until original Greek copies resurfaced in the fifteenth century. Conservatism on Ptolemaic astronomy among Arab Muslim scholars persisted up to the late 19th century, as demonstrated by Shaykh Rifā‘a al-Taḥṭāwī’s confident tone that: “although Copernicus negated the geocentric Ptolemaic system and reverted back to heliocentric Pythagoreanism, which was accepted and practiced by the Europeans, there is no cause for despair, for the progress of intelligence over a long period of time will return the *Frangis* (i.e Europeans) back to the Ptolemaic system after an extended period equal to the period which has elapsed from the time of Ptolemy to the time of Copernicus”. (From John W. Livingston, ‘Western Science and Educational Reform in the Thought of Shaykh Rifā‘a al-Tahtawi’, *International Journal of Middle East Studies*, Vol.28, No.4, November 1996, p.558)

⁷¹ Notable examples are *Al-Kitāb al-Hāwī* (*Continens Liber*) of Al-Rāzī and *Al-Qānūn fī al-Ṭibb* (‘*The Canon of Medicine*’) by Ibn Sīnā, works used in Europe for centuries.

⁷² The accumulating recovery of western intellectual endeavour was evident from the mid-eleventh century as the rise of towns and of the earliest bureaucratic states provided the economic infrastructure to a proto-renaissance that historians refer to as the High Middle Ages.

⁷³ Bertrand Russell, *The History of Western Philosophy*, Simon and Schuster, New York, 1945, p.427.

Greek texts by Byzantine émigré scholars in Italy combined with the accelerator effect of the newly developed printing press.⁷⁴

The mechanism of scientific progress - philosophical method

For the student to understand the mental mechanisms that have historically permitted scientific and technological advance, it is important to inculcate the fact that the operative factor is not simply one of an accumulated body of data but rather one of *method*, and that the development of the ingredients making up that method depended upon the status and fate of a philosophical underpinning. What was the difference between Europe and the Middle East in this respect?

Europe was less developed, but had no conceptual barrier to natural philosophy

The trajectories of European and Middle Eastern civilisation in the centuries that preceded the rise of the scientific expansion are illustrative of the importance of this underpinning. At the time of the High Islamic Civilisation Europe was, by comparison, materially under-developed and alongside the decline, particularly in the West, of the sophisticated urbanised societies of the Classical era the migration of centres of learning to ecclesiastic and monastic foundations meant that priorities became understandably more doctrinally focused.

However, while the impetus of scholarly endeavour reflected this focus, despite the religious antipathy to the pagan past there was statistically very little attempt to eradicate all trace of classical Greco-Roman learning and its Hellenistic rational currents. That is because the intellectual life of the Church was born and nurtured in this classical idiom, which bequeathed the Church its theological vocabulary, its doctrinal apologetic reasoning and even the symbols and ranks of the Roman state.⁷⁵

Important in the early evolution of Christianity was the influence of the classical intellectual heritage. As men trained in Hellenic and Roman modes of thought became converted, they began to reinterpret the new doctrines in the terms to which they were accustomed. Thus, Christian theology was presented in the language of Greek philosophy and of Roman law. Much of the classical tradition was worthy of preservation and could be harmonized with the new religion.⁷⁶

For all the religious imperatives to repudiate the heathen world, Christianity's conquest of the pagan mindset was something which had occurred from *within*. The Church had ingested the Greco-Roman heritage deep into its bones. In subsequent centuries, throughout the entire period dubbed the 'Dark Ages' the learning of the ancient Greeks had a vigorous after-life in Byzantium because the Greek classics – its literature, philosophy, history, art and even its mythology – constituted the curriculum of education.⁷⁷

From the outset, prominent Christian theologians not only did not suppress Greco-Roman learning, nor even allow it to wither on the vine, they actively championed it. St. Augustine held

⁷⁴ Italian scholars began journeying to Byzantium in the early fifteenth century in search of Greek books. In 1423 the Sicilian Giovanni Aurispa returned to Venice with 248 books by classical Greek authors, most of which were unknown to the West. After the fall of Constantinople several Byzantine scholars established themselves in Italy, especially in Venice. John Argyropoulos from 1456 taught Greek in Florence, Theodore Gaza of Thessaloniki taught at Ferrara, Naples, and Rome, Demetrius Chalkondyles of Athens at Padua, Florence and Milan, and George of Trebizond in Rome. These scholars not only encouraged the study of ancient Greek authors, they also carried out important research and publication themselves, including the translation of Greek works into Latin.

⁷⁵ Cf. the Roman administrative terms for 'administrative region' – διοίκησις ('diocese'); 'overseer' – ἐπίσκοπος أسقف ('bishop'); 'public service' – λειτουργία ('liturgy') and so on. The Latin term *Pontifex Maximus*, ('Chief Pontiff') prior to its adoption by Christianity to designate the Pope, referred to a member of the most illustrious of the colleges of priests of the Roman religion, and its literal meaning of 'bridge-builder' is thought to refer to ancient tasks and rites associated with bridges in the early Roman period.

⁷⁶ Henry Bamford Parkes, *Gods and Men, The Origins of Western Culture*, Routledge and Kegan Paul, London, 1960, p.378.

⁷⁷ The argument of Byzantine antipathy to pagan learning is highly disputed simply because of the evidence of imperial decrees actively promoting the preservation of Greek and Latin manuscripts and the strong admixture of classical learning in the writings of all the major Christian scholars the length of the Byzantine period. Extended, arguments for Christianity's positive role vis-à-vis the heritage of Hellenism are J. Hannam: *God's Philosophers, How the Medieval World laid the Foundations of Modern Science*, Icon Books, London 2009, and Demetrios J. Constantelos: *Christian Hellenism. Essays and Studies in Continuity and Change*, Aristide D. Caratzas, New Rochelle, New York & Athens.

that knowledge and reason precede Christianity and gave encouragement to scientific inquiry, exhorting Christians to use the classical sciences as a handmaiden of Christian thought. Indeed, the value of classical learning was seen by the most influential scholars as self-evident, and opposition to it as the mark of the ignorant. St. Gregory the Theologian⁷⁸ in the fourth century argued that all education was valuable, even the culture which some others had ‘ill-judgingly abhorred, as treacherous and dangerous’ since from it

we have received principles of enquiry and speculation, while we have rejected their idolatry, terror, and pit of destruction ... We must not then dishonour education, because some men are pleased to do so, but rather suppose such men to be boorish and uneducated, desiring all men to be as they themselves are, in order to hide themselves in the general, and escape the detection of their want of culture.⁷⁹

Christian intellectuals and clerics argued that studying the Greek *literae humaniores* also trains the Christian mind to understand better his own faith. By studying, for instance, the pagan poetry of Hesiod, Homer, Solon and Theognis, the skill “to trace the silhouette of virtue” becomes matured, and “those who carefully gather the useful from each book are wont, like mighty rivers, to gain accessions on every hand.” Despite the antipathy expressed by the more orthodox, statistically their objections fell on deaf ears.

Plato or Aristotle?

One important feature of introducing into the curriculum a study of comparative culture is the demonstration of how the Islamic and Christian worlds exhibit a remarkably similar trajectory in the handling of the challenges posed by the Greek philosophical heritage and how this was to be harmonised with the account of reality as contained in scriptural revelation. In the working out of this ‘debate’ the Islamic world was approximately one century ahead of Christian Europe.

The key to the dynamic of development, and the issue at stake for both the Christian and Islamic worlds, was the position to take on what was termed the ‘natural philosophy’ as expounded in the works of Aristotle. Broadly speaking natural philosophy was the study of change and motion in the physical world, and was the contemporary term for what today would also cover physics and biology, and is thus a precursor to what we understand today by the word ‘science’. The focus on Aristotelianism is also important as a paradigm for the transformation of mindset that took place in all fields of endeavour at the beginning of the trajectory that led to the scientific revolution of the seventeenth century. This is because the reach of its methodology extended well beyond that of the examination of the natural world and extended into the fields of logic, epistemology, ethics and even theology.

In common with Europe before the thirteenth century, philosophical endeavour in the Islamic world wrestled with the interweaving of Platonism and Aristotelianism. In fact there was among Arab philosophers a stronger attraction from the outset to the mystical aspects of late classical philosophy, particularly Neo-Platonism, as indicated by the first works of Greek philosophy that were translated into Arabic: *The Enneads* of Plotinus and *The Elements of Theology* of Proclus – some of the basic texts of Greek Neo-Platonism.⁸⁰ This philosophy tinged with pseudo-science was passed on into the works of the Muslim scholastics, the *mutakallimūn*, and even tainted the work of Ibn Sīnā, whose encyclopaedic *Kitāb al-Shifā’* came to be seen as the authoritative voice of Aristotelianism, until subsequently contested and repudiated by more rigorous Aristotelians such as Ibn Rushd. A parallel task for Christian Europe was carried out by prominent scholars such as Albertus Magnus (c.1200-1280), who sought to harmonise the works of Aristotle and

⁷⁸ Also known as Gregory of Nazianzus (329-391). He served as archbishop of Constantinople and is considered to be the most accomplished rhetorical stylist of the patristic age. As a classically trained speaker and philosopher he infused Hellenism into the early church.

⁷⁹ Εἰς τὸν μέγαν Βασίλειον ἐπίσκοπον Καισαρείας Καππαδοκίας ἐπιτάφιος (*Funebris oratio in laudem Basilii Magni Caesareae*), Migne, *Patrologia Graeca*, Vol. 35, p.5. Gregory the Theologian, from *The Funeral Oration on St. Basil the Great*, 11.

⁸⁰ Cristina D’Ancona, *Greek into Arabic, Neoplatonism in translation*, in P. Adamson and R. Taylor (edd.) *The Cambridge Companion to Arabic Philosophy*, Cambridge University Press, 2005, p.21.

Plato with Church doctrine, and later by his pupil Thomas Aquinas (1225-1274) who, again as a more emphatic Aristotelian, was able to discard as unnecessary or irrelevant the esotericism common to much of the ancient philosophical tradition.⁸¹ The important difference in the experience of the two faiths in this endeavour was that its relative indigenisation within Christian doctrine meant that the legitimacy of philosophical speculation as such remained unchallenged.

The fate of Aristotelianism in Europe

Towards the end of the twelfth century western Europe saw a revival of learning as scholars benefited from a reform programme promoted by the papacy, that took the form of the development of cathedral schools. This brought renewed interest in the heritage of classical antiquity, primarily as represented by traditional Latin language sources which, as a result of the labours of theology and philosophy scholars such as Boethius, had conveyed much of the Aristotelian legacy to early medieval Europe.

Before the end of the twelfth century, however, this endeavour was transformed by the infusion of new books containing new ideas freshly translated from Greek and Arabic originals. Greek texts were mediated into the Latin west via Byzantine scholars who had maintained an uninterrupted link with the heritage of their ancestors, and via a concerted campaign, under the sponsorship of the Archbishop of Toledo, that saw among other things the systematic translation of the Aristotelian commentaries by Ibn Sīnā, al-Farābī, and al-Kindī.

This infusion represented in Europe a knowledge explosion. Once the full scope of Aristotle's works became known it became clear that his philosophical systems were applicable to an enormous range of scholarly issues treated in the schools. They greatly expanded the traditional 'seven liberal arts'⁸² syllabus of the cathedral schools – grammar, rhetoric, logic, geometry, arithmetic, music and astronomy – with the addition of works on medicine and on Aristotelian natural philosophy. This last category of study had hitherto been engaged with in a somewhat rudimentary form, derived from a limited number of sources from the classical period such as Plato's dialogue *Timaeus*, a work which provided pre-twelfth century Europe with its most coherent (and in the modern sense 'pre-scientific') explanation of subjects as diverse as cosmology, astronomy and the nature of matter and change.⁸³

By the end of the twelfth century, Latin Christendom had recovered major portions of the Greek and Arabic philosophical and scientific achievement; in the course of the thirteenth century many of the remaining gaps would be filled. These books were copied and spread quickly to the great educational centres, where they contributed to a revolution that transformed the entire nature and course of education on the continent.⁸⁴

The intermingling of intellectual endeavour during this period was remarkable, and demonstrates the imperviousness of scholarly endeavour at the time to any reservations about cultural contamination.⁸⁵ For instance, a highly significant work for the development of the scientific

⁸¹ Ernest L. Fortin, *Classical Christianity and the Political Order, Reflections on the Theologico-Political Problem, Collected Essays, Volume 2*, Ed.J. B. Benestad, Rowman & Littlefield Publishers INC., New York, London, 1996, p.153.

⁸² So called since they were the essential tools a free person (from the Latin *liberalis* – 'worthy of a free person') must know to become a functioning member of society. Together, the seven liberal arts represented the thinking skills, and served as a basis for the education of all. Those who wished to specialize would first obtain an education in the liberal arts before proceeding to the practical arts (medicine, architecture) or other fields such as philosophy or theology. The purpose of learning these arts was to train the mind *how* to think, as opposed to *what* to think.

⁸³ In the *Timaeus* Plato was at pains to repudiate the attitude of the pre-Socratic *physikoi* philosophers who had "deprived the world of divinity, plan and purpose" and instead of their claims to an intrinsic nature (*physis*) accounting for the order and regularity of the cosmos, posited an extrinsic divine mind (*psyche*) as the cause for the coherence of the physical world, as one animated cosmos, replete with purpose and design.

⁸⁴ David Lindberg, *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, prehistory to A.D. 1450*. University of Chicago Press, 2nd ed. 2007, pp.217-18.

⁸⁵ The case of Gerard of Cremona (ca. 1114-1187) is remarkable. Having learned Arabic specifically for this purpose, he went on to translate as part of the Toledo initiative most of the Aristotelian works in the natural sciences and 87 works in all. For translations of Aristotelian works into Latin direct from the Greek the conspicuous figures are James of Venice (fl. 1136-48) and William of

method was Aristotle's *Posterior Analytics* since it represents Aristotle's systematic exposition of his understanding of the nature of science and the role of demonstration in acquiring knowledge of the natural world. In 1209 the Oxford scholar Robert Grosseteste produced the first full exposition of the Greek text of this work, and within eleven years the commentary by Ibn Rushd on this text was circulating in a Latin translation. Forty years after that compendious commentaries by major figures such as Albert the Great and Thomas Aquinas, incorporating unapologetically the advances made by the Arab Aristotelians, were the common currency of universities all over Europe. This new injection of Aristotelian sources radically altered the intellectual life of the West.

Just as in the Islamic world, the scholarly endeavour in the handling of Greek philosophy was one of examining, incorporating and justifying the application of Aristotelian methodology to the examination of nature and to the harmonisation with Revelation.

There were inevitable tensions in this process, and history records the famous case of the Bishop of Paris issuing a Condemnation in 1277 of a number of ideas in natural philosophy, including the denial of creation and the assertion of the eternity of the world, along with many other accusations that were almost identical to those launched by al-Ghazālī a century earlier against rationalising philosophy in his *Tahāfut al-Falāsifa* ('The Incoherence of the Philosophers'). But while incidents such as these temporarily impeded 'scientific' research into phenomena in the natural world, conversely theologians (who were thoroughly trained both in 'natural philosophy' and theology) were left free to effectively assert the *lack* of conflict between Revelation and the natural sciences, and apply this philosophical method to theology itself.⁸⁶

The tussle between Christian doctrine and Greco-Roman rationalism never therefore reached the level of a successful prohibition. The philosophical heritage was an assumed permanent constituent of Christian civilisation, so that theologians were rarely forced to contend with an anti-philosophic bias on the part of the ecclesiastical authorities. Not only would this have been regarded as unacceptable, the weighting in favour of philosophy was taken as read:

Not only was philosophy already accredited in the West and officially sanctioned by canon law but a knowledge of it was required of all students of theology ... In Aquinas's works it is rather theology which is justified before the bar of reason or philosophy. The first article of his best-known work, the *Summa Theologiae*, does not ask whether the study of philosophy is permissible and desirable but whether besides the philosophic disciplines another science, namely sacred doctrine, is necessary.⁸⁷

The attitude of Aquinas prevailed, so that henceforth there was no effective persecution of anyone who advocated philosophy as an aid in interpreting scripture.

The case of Galileo Galilei and his trial in 1616 for advocating heliocentrism actually illustrates this point, since what it demonstrates is that Aristotelian philosophy and the natural sciences founded upon it had become so integrated into theology and indispensable to it, that Galileo's experimentally acquired evidence was being opposed precisely because it called this established and accepted Aristotelian philosophy into question.⁸⁸

The Church and its theologians had thus fully embraced and accepted Greco-Arabic science and natural philosophy. Without this acceptance, natural philosophy could not have become the basis

Moerbeke (fl.1260-86) who set out to provide Latin Christendom with a complete and reliable version of the entire Aristotelian corpus.

⁸⁶ Edward Grant, *The Nature of Natural Philosophy in the Late Middle Ages*, The Catholic University of America Press, Washington, 2010, p.251.

⁸⁷ Ernest L. Fortin, *Op.cit.*, p.153.

⁸⁸ While Galileo was condemned for "vehement suspicion of heresy" for his defense of heliocentrism as an attempt to reinterpret the Bible, his work moved forward and his inquiry was carried on by others. Subsequently Pope Urban VIII, a friend and admirer of Galileo who had opposed his condemnation, encouraged him to publish a work, the *Dialogue Concerning the Two Chief World Systems*, with formal authorization from the Inquisition, laying out the merits of the opposing cases equitably. In other words, institutional dedication to scientific inquiry was too entrenched in Europe for any authority to control it.

for a liberal arts education in mediaeval universities and would therefore not have been institutionalized throughout Western Europe. Indeed “it is wholly appropriate to call them ‘theologian-natural philosophers’”, argues Edward Grant, for

they were equally at home in both disciplines and were keen to import as much natural philosophy as they could into the resolution of theological problems, while avoiding any temptations to theologize natural philosophy ... By their actions, theologians in the West were full participants in the development and dissemination of natural philosophy. They made it possible for the institutionalization of natural philosophy in the universities of the late Middle Ages, and therefore its extensive dissemination.⁸⁹

Subsequently, many of the major figures in the development of science in the scientific revolution of the seventeenth century were Christian priests and believers who sought through the practice of rational science “to discover the true Nature of the Works of God”.⁹⁰

The fate of Aristotelianism in the Middle East

In Islam, however, this same Aristotelian natural philosophy that was incorporated into the body of theology in Christian Europe elicited a more deeply rooted suspicion. Al-Ghazālī’s response, a century earlier than the Paris Condemnation, to the challenge of the ‘eternity of the world’ (along with other challenges thrown up by the natural philosophers), illustrates the tone. Such things, he warns,

do not concord with Islam in any respect. The one who believes them believes that prophets utter falsehoods and that they said whatever they said by way of [promoting common] utility, in order to give explanatory examples to the masses. This is a manifest disbelief which none of the Islamic sects held ... As for their doctrine of the necessary [connection] of natural causes [and their effects] this is one which the Mu‘tazila have explicitly expressed in their doctrine of generation ... Anyone minded to declare infidel such sectarian innovators, will also declare these as infidels. Whoever might hesitate in pronouncing these as infidels will certainly be content to confine himself to pronouncing [the philosophers] infidels on these questions.^{91 xvii}

This challenge was thus more influential. If there was nothing in mathematics or natural science that was essentially contrary to faith, study of them could nevertheless lead the believer astray. Secular learning, philosophy, and, the ‘foreign sciences’ are therefore to be judged by their conformity to religious doctrine. This repudiation of the Greek philosophical trust in reason placed scientific investigation subject to significant constraints and prejudice.⁹²

Ibn Rushd, in his treatise *On the Harmony of Religion and Philosophy* felt impelled to mount a defence in answer to the question of “whether the study of philosophy and logic is allowed by the Islamic Law, or prohibited, or commanded – either by way of recommendation or as obligatory”^{93 xviii} and a generation later Ibn al-Ṣalāḥ al-Shahrazūrī’s condemnation of Ibn Sīnā as “a human devil” was buttressed by his famous *fatwā* denouncing philosophy and logic as “the foundation of folly, the cause of all confusion, all errors and all heresy”.⁹⁴ Another generation later Ibn

⁸⁹ Edward Grant, *Science and Religion, 400 B.C. to A.D. 1550: From Aristotle to Copernicus*. Johns Hopkins University Press, 2006, p.244.

⁹⁰ An example of this was the pioneering chemist and physicist Robert Boyle (1627-91) who was a devout apologist for the Christian faith and who, in his *Last Will and Testament* addressed his fellow members of the Royal Society of London, wished them all success in “their laudable attempts to discover the true Nature of the Works of God” and prayed “that they and all other Searchers into Physical Truths” may thereby add “to the Glory of the Great Author of Nature, and to the Comfort of Mankind.” See Rodney Stark, *For the Glory of God How Monotheism led to Reformations, Science, Witch-hunts, and the End of Slavery*. Princeton and Oxford, 2003, p.158.

⁹¹ Al-Ghazālī, تهافت الفلاسفة للإمام الغزالي (‘*Incoherence of the Philosophers*’), ed. Sulaymān Dunyā, Cairo, pp.308-9.

⁹² On this, and the comparison with the situation in Christian Europe, see Edward Grant, *The Nature of Natural Philosophy*, p.255ff.

⁹³ Ibn Rushd, كتاب فصل المقال وتقرير ما بين الشريعة والحكمة من الاتصال (‘*Decisive Treatise Confirming the Connection of Sharī‘a and Philosophy*’), Ed. A. Nadir, 2nd Ed. Dār al-Mashriq, Beirut 1968, p.26.

⁹⁴ B. Krawietz and G. Tamer (edd), *Islamic theology, philosophy and law, debating Ibn Taymiyya and Ibn Qayyim al-Jawziyya*, De Gruyter, Berlin/Boston, 2013, p.263.

Taymiyya went on to harden the prohibition by authoring several works in condemnation of the discipline.⁹⁵

The problem was the fact that the Arab pioneers of Islam did not emerge from within the intellectual fabric of the Greco-Roman world, but, in contrast to the slow absorption of Christianity from below, arrived dynamically on the stage as conquerors. According to Edward Grant this had implications for the way it responded to the scientific heritage it encountered, in that while

the slow spread of Christianity provided Christians an opportunity to adjust to Greek secular learning ... Islam's rapid dissemination made its relations with Greek learning much more problematic.⁹⁶

They were unacquainted with systematic philosophical thought before the rise of Islam, and only came to develop it as a result of cultural blending. Since the interloper sciences were not absorbed into the cultural bloodstream and failed to gain an institutional footing in the Islamic world, the intellectual space was dominated by the more culturally 'authentic' disciplines of Arabic grammar, Qur'ānic *tafsīr*, hadith scholarship, and the principles of Islamic law.⁹⁷ The Islamic world was thus forced, historically, to engage in a more thoroughgoing debate on the relationship between philosophy and faith in the Middle Ages. In this debate with Greek learning four broad positions emerged:

- The legal scholars (*fuqahā'*), who made no real use of Greek philosophy, likely because they found it a threat to revealed truth;
- The *mutakallimūn* scholastics, who emphasised rational discourse and to which they added the authority of revelation, thus employing Greek philosophical ideas to explicate and defend the Islamic faith. This scholastic current may be further subdivided into:
 - Rationalist scholastics (*al-Mu'tazila*), who equated the power of reason to that of revelation, adopting Greek methodology for its utility in understanding the Islamic faith and explaining controversial elements in the scripture which threatened to contradict the dictates of reason (such as anthropomorphic expressions) as metaphors, in order to bring it into harmony with reason;
 - Traditionalist scholastics (*al-Ashā'ira*), who adopted methodologies (in reaction against the *Mu'tazila*) with varying degrees of rationalist underpinning, leaving what they failed to understand in the scriptural sources (such as anthropomorphic expressions) to be accepted just as they stood, 'without asking how' (*bilā kayf*);
- The philosophers (*falāsifa*), mainly Aristotelians, who placed greatest reliance on reasoned argument while downplaying the authority of revelation, with any agreement with the doctrines of the faith achieved by means of a broad interpretation (*ta'wīl*) of the Qur'ānic text. They employed natural philosophy and logic to acquire truth for its own sake, which usually signified that they were placing religious faith outside of the discussion.

⁹⁵ His main work on the subject, the 'Response to the Logicians' (*Al-Radd 'alā al-Mantiqīyyīn*) was highly influential, and in the fifteenth century the Shāfi'i jurist al-Suyūṭī published an abridgment of it that was widely circulated. He is associated with the famous formula that *Man tamantaq fa-qad tazandaq* "he who practices logic is an atheist" – on the grounds that their endeavours "do not contain knowledge that is commanded in the Sacred Law ... Some people have stated that the sciences are not established save with it – this is a gross error both rationally and legally". See Shaykh Sa'īd Foudah, *تدعيم المنطق*, Dār al-Rāzī, 47.

⁹⁶ Edward Grant, *The Nature of Natural Philosophy*, p.254.

⁹⁷ Ibn al-Ṣalāḥ al-Shahrazūrī encapsulates this preoccupation with authenticity in his *fatwā* against logic, on the grounds that "preoccupation with the study and teaching of logic has not been permitted by the Lawgiver, nor has it been suggested by his Companions or the generation that followed him, nor by the learned imams, the pious ancestors, nor by the leaders or pillars of the Islamic community whose example is followed." See Ibn al-Ṣalāḥ, *فتاوى ابن الصلاح في التفسير والحديث والأصول والفقه*, ed. A. Qal'ajī, Cairo 1403/1983, p.71.

The position of the traditionalist Ash'arī scholastic al-Ghazālī is an interesting demonstration of the dilemma, in that he was adamant in stressing – in contradiction to the *fuqahā'* and the ultra traditionalists – that religious faith does not require the rejection of natural philosophy, and that such a position only engenders a counter-reaction that leads to disbelief.^{98xix} Al-Ghazālī's solution, shared by many thinkers, was that the arenas of faith and natural philosophy should not be made to conflict with each through lack of knowledge of either discipline,

seeing that there is nothing in revealed truth opposed to these sciences by way of either negation or affirmation, and nothing in these sciences opposed to the truths of religion.^{99xx}

In this respect al-Ghazālī was performing the same service for Islamic thought that Thomas Aquinas performed a century later for Christianity, in that the two *magisteria* – the one theological, the other natural science – are to be considered as constituting an independent field of endeavour.

On the other hand, 'unrestrained' employment of the 'mathematical sciences', al-Ghazālī argued, can seduce the exponent into an exaggerated admiration for their effectiveness at establishing truth to the exclusion of Revelation, and "infect them with the evil and corruption of the philosophers."^{100 xxi} Al-Ghazālī viewed with suspicion the rationalist Mu'tazilī employment of philosophy as opening up a slippery slope towards the position of the philosophers such as Ibn Rushd, Al-Farābī and Ibn Sīnā, particularly in their belief in secondary causation. Al-Ghazālī thus considered Aristotelian natural philosophy unacceptable since it assumes that natural objects can act by virtue of their own essences and natures, that physical objects are capable of causing effects in other physical objects. The position was exemplified in the 'hand moving the water' disputation, whereby in consistency with Ash'arite presuppositions, al-Ghazālī "admits that the motion of the water is not strictly speaking even the act of the man whose hand moves the water. It is the act of God who moves the man."¹⁰¹ Ambiguities such as this were to lead the Islamic world off the world stage of scientific progress as the necessity that links cause and effect was undermined.¹⁰²

Aquinas, for his part, differed in that he rejected (as did the Mu'tazila) the reduction of the natural order to a status of a 'habit' that the divinity may overturn at will, or the impossibility of a secondary causation between matter independent of the direct intervention of the deity. Not only did Aquinas assert the status of natural science as the perfection of man's understanding of the natural order of the universe, he maintained that the natural world is complete in itself even without divine grace, and that it possesses its own intrinsic perfection in that it has within itself

⁹⁸ "(The) drawback arises from the man who is loyal to Islam but ignorant. He thinks that religion must be defended by rejecting every science connected with the philosophers, and so rejects all their sciences and accuses them of ignorance therein. He even rejects their theory of the eclipse of sun and moon, considering that what they say is contrary to revelation. When that view is thus attacked, someone hears who has knowledge of such matters by apodeictic demonstration. He does not doubt his demonstration, but, believing that Islam is based on ignorance and the denial of apodeictic proof, grows in love for philosophy and hatred for Islam." W. Montgomery Watt (tr.), *Imām al-Ghazālī's Deliverance from Error and The Beginning of Guidance*, Islamic Book Trusts, Kuala Lumpur, Revised Edition, 2005, pp.22-23.

⁹⁹ W. Montgomery Watt, *Op.cit.*, p.23. From his conviction that there was no way to certain knowledge or the conviction of revelatory truth except through Sufism, al-Ghazālī and that argued in his work *Ihyā' 'Ulūm al-Dīn* ('The Revival of the Religious Sciences') that the dogmas of Ash'arī *kalām* could constitute a veil preventive of the attainment of gnosis (*ma'rifa*) and that the primary purpose of Ash'arism was the defence of traditional Islamic belief, the '*aqida*', against the distortions of heretical innovations. See M. Marmura, 'Ghazali and Ash'arism Revisited', *Arabic Sciences and Philosophy*, Cambridge University Press, Vol. 12, Issue 1, March 2002.

¹⁰⁰ "This is a great drawback, and because of it those who devote themselves eagerly to the mathematical sciences ought to be restrained. Even if their subject-matter is not relevant to religion, yet, since they belong to the foundations of the philosophical sciences, the student is infected with the evil and corruption of the philosophers. Few there are who devote themselves to this study without being stripped of religion and having the bridle of godly fear removed from their heads." W. Montgomery Watt, *op.cit.*, p.22.

¹⁰¹ Barry Kogan, *Averroes and the Metaphysics of Causation*, University of New York Press, 1985, p.66.

¹⁰² Al-Ghazālī's pre-occupation with denying secondary causation was that "we must occupy ourselves with this question in order to be able to assert the existence of miracles and for still another reason, namely, to give effective support to the doctrine on which the Muslims base their belief that God can do anything." The argument was therefore not a matter of physics, but of theology and the problem of a competing source of knowledge to a source of knowledge that he already has, namely, scripture. On this see, B. Kogan, *Op. cit.*, pp.71-2.

the means by which it is capable of attaining its end.¹⁰³ The laws of nature are thus not a challenge to God's authority but an expression of it. The understanding of the one was simultaneously the understanding of the other. This allowed for the scientist to engage in investigation of the natural order without the taint of offending against the omnipotence of the divinity or of leading others into doubt.

The implications of this position were momentous and decisive for the history of Europe, since it was this metaphysical support for natural law that cleared the way for the development of modern science.¹⁰⁴

The institutionalization of independent centres of learning

A further insight derived from the comparative study of civilisation underlines another fact that led to the progress and acceleration of the scientific enterprise in Europe: the role of the institutional mechanisms that promoted and refined scientific endeavour.

In line with the Islamic world's 100-year advance on Europe, historians award the primacy of institutionalised learning in the medieval period to Middle Eastern foundations, notably that of the *Jāmi'at al-Qarawiyyīn*, founded in Morocco by Fāṭima Bint Muḥammad al-Fihriyya in 859, and the *Jāmi'at al-Azhar* in Egypt, founded in 970 by the Fatimids as a centre of Islamic learning. The development in Europe is also considered to have been influenced by westerners' contact with the madrasa systems in Islamic Spain, Islamic Sicily and the Levant during the period of the Crusades and the institutions of education in the Byzantine Empire.

The point of departure that sets off the European trajectory from the Middle Eastern, was the institutionalisation of the *methods* of learning. Historians note in this respect one significant difference: the tendency in medieval Europe towards hierarchical organisation, as opposed to an individualistic and personalised system in medieval Islam.

The comparison is neatly represented by the respective systems of authorisation: the *ijāza* in Islam and the *licentia docendi* ('license to teach') in Europe. In the case of the former the certification remained a personal matter between the master and the student. The *ijāza* was conferred on an individual for a particular work, or series of works, and authorised the bearer to teach its contents, legitimised by his relationship to the author or master by a chain of transmitters. The master/authors retained control of the subsequent development of the studies and certification was entirely at the discretion of these individuals, who could withdraw it if so minded.¹⁰⁵

Such was the case with Europe too, with certification at the discretion of the chancellor of one of the cathedral schools, until the rise of the *licentia docendi* system. This development came about as a result of the rise of 'guilds' of scholars who protected their interests against abuse whether from spiritual or mundane quarters,¹⁰⁶ and which effectively took over from the cathedral chancellors the right of certification. These privileges were supported both by kings and by the papacy.¹⁰⁷ More rights subsequently ensued: the right to choose their own members; protection of

¹⁰³ Ernest L. Fortin, *op.cit.*, p.155.

¹⁰⁴ For a thorough treatment of the implications of the triumph of Ash'arism for the modern Muslim world, see Robert Reilly, *The Closing of the Muslim Mind, How Intellectual Suicide Created the Modern Islamist Crisis*, ISIS Books, Wilmington, Delaware, 2010.

¹⁰⁵ The personal discretion even applied in cases such as the Nizāmiyya madrasas founded in the eleventh century. Though funded by the royal establishment and the elite class, the curriculum was under the personal supervision and approval of the founder Nizām al-Mulk, and not under the state.

¹⁰⁶ The case of an incident at Paris in 1200 is illustrative of this development. A dispute between a student and an innkeeper degenerated into a fatal mêlée between townsmen and students with their tutors. Finding no support from the cathedral chancellor the students and tutors organised themselves into a corporation ('*universitas*') to press their case with the king as spokesmen for *The University of Masters and Students of Paris*. For reasons of practical economics the king granted them a set of privileges and protections. This effectively established the union of the tutors and students as an independent corporate entity.

¹⁰⁷ "The medieval Church extended this protection because the arts were necessary to read and interpret Scripture. Even lay scholars without the tonsure enjoyed clerical status, subject to ecclesiastical law, and were immune from the jurisdiction of feudal and local civil courts. In 1155 Emperor Frederick I (Frederick Barbarossa) issue the Authentic *habita* to guarantee protection and safe conduct

person and property, protection from local police and courts, deferment from military draft and municipal obligations, the right of each member to keep his license to teach as soon as he had been admitted to full membership. The natural results of this development were fixed curricula and fixed periods of study and examinations that were not subject to the personal discretion of the individual tutor. Most significant was the development of the *licentia ubique docendi* ('the license to teach anywhere') which enjoyed official recognition from the state and which therefore allowed for the independent propagation of learning.¹⁰⁸

The corporate entity

Protecting this independence was a facet of European legal culture that was absent in Islamic law: *the corporate entity*. While Islamic law recognises no such entity, and restricts recognition solely to a physical, natural person, Europe enjoyed a long tradition, developed from Roman law, of recognising a 'juristic person' – that is, a fictitious legal 'person' that exists independently of its individual members and which has interests recognised and secured by the law. This combined with a commonplace and spontaneous process for individuals sharing similar professional and economic interests – merchants, craftsmen, clerics, teachers – to come together to form corporations or guilds. The most common Latin term for such an entity was *universitas* (as in *universitas magistrorum et scholarium* – 'the corporation of masters and scholars') so that "it was but an accident of history that the Latin *universitas* (corporation or whole body) came to refer exclusively to the places of higher learning that retain the name universities."¹⁰⁹

Because European universities were legally autonomous, they had the right to develop their own rules, their own curricula, their own standards of accomplishment, the right to award degrees, appoint new masters to its faculties, and the right to debate any subject and uphold in debate any subject. The scholarly norms they incorporated soon became those of curiosity, skepticism and challenge. As Edward Grant notes,

The corporation, or *universitas*, is of crucial significance ... because the universities that had emerged by 1200 – London, Paris, and Oxford – were self-governing corporations with numerous rights and privileges. It was these corporate entities, these universities, that would institutionalize reason and reasoned discourse in European society.¹¹⁰

By the end of the Middle Ages Europe saw a rapidly expanding network of universities numbering over 60, all of them recognised by Popes and secular rulers alike, who regarded them as markers of prestige. The result was an institution which had no real equivalent anywhere else in the world.¹¹¹

The emergence and establishment of the 'scientific method'

A combination of all the above elements provided the groundwork for the historic trajectory taken by Europe as it moved from the religious to the scientific conception of knowledge. That there is something unique about this trajectory is underlined by Nidhal Guessoum. Here he clarifies an important point in the discussion of the relationship of Europe to the scientific endeavour:

to all teachers and students travelling to and from seats of learning throughout the Holy Roman Empire." James Axtell, *Wisdom's Workshop, The Rise of the Modern University*, Princeton University Press, 2016, pp.4-5.

¹⁰⁸ On this see George Makdisi, 'Madrasa and University in the Middle Ages', *Studia Islamica*, No. 32 (1970), pp. 255-264.

¹⁰⁹ Toby Huff, *The Rise of Early Modern Science: Islam, China, and the West*. Cambridge University Press, 1993, p.135. There is some degree of misconception in the Muslim world concerning this word. Cf. Muhammad Naquib al-Attas: "The general character and structure of the universities today, which are veritable copies of Western models, still reveal significant traces of their Islamic origin. The very name for the institution which derives from Latin: *universitatem* clearly reflects the original Islamic *kulliyah*." *Islām and Secularism*, International Institute of Islamic Thought and Civilization, Kuala Lumpur 1993, p.154.

¹¹⁰ Edward Grant, *God and Reason in the Middle Ages*. Cambridge University Press, 2004, p.99

¹¹¹ Edward Grant, *Op. cit.*, p.100.

When the question of the relationship that may or should exist between religion and science is raised, Muslim interlocutors often insist that Islam has never had a problem with science, that the question only poses itself in western culture due to the Church's old suspicion towards, and oppression of, science (the Galileo affair). Muslims invariably cite many Qur'anic verses to support the idea of Islam's encouragement of science, starting with the very first word revealed to Prophet Muhammad, *Iqra* ('Read/Recite!', Qur'ān 96:1) to '*Truly fear Allah those among His Servants who have knowledge*' (35:28). This typical, widespread, and instinctive reaction, however, betrays a number of misunderstandings ... most, if not all, of the Islamic references in this regard are about 'knowledge', '*ilm*', a term which has been understood in many different ways, including 'religious knowledge', 'knowledge of God', and sometimes 'science' (in a general sense).¹¹²

The fundamental features of the scientific method as we understand it today, on the other hand, are more closely delineated and may be usefully summarised as "the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence."¹¹³ The methodology of this pursuit is characterised by a desire to remove pre-conceptions and culturally inherited patterns of thought (it is important to emphasise here that 'scientific patterns of thought' are emphatically *not* inherited by Europeans as part of their culture) and to yield results that are similarly beyond the influence of culture, being repeatable and applicable *universally*. It may usefully be broken down into the following activities:

- *Characterizations* (preliminary definitions. measurements of the subject of enquiry, first observations)
- *Hypotheses* (provisional explanations of the observations and measurements, to be subjected to subsequent testing)
- *Predictions* (i. the consequences that should follow from the hypotheses if these are correct; ii. the elements that would, if encountered, nullify these hypotheses)
- *Experiments* (tests designed to locate any of those predicted elements that would nullify the hypotheses)
- *Repeatability of the demonstration and critical peer review*

The multiple origins of science

Various elements in this process were practiced over the centuries by individual scientist scholars who drew their influence from many and diverse sources, some of them very ancient. Historians of science, for instance, note the realistic methodical observations of injuries and their treatment on a fragment of an Egyptian medical papyrus dating from 1,600 BC and an equal lack of resort to magic or ritual in a contemporary Babylonian work.¹¹⁴ They note that already in the sixth century BC the Greek thinker Thales had repudiated the religious/mythological explanation of natural phenomena and that Mo Tzu in China and Democritus in Greece had at about the same time (c 400 BC) advocated using one's senses to observe and test the truth or falsehood of conceptions on these phenomena.

The shift from a predominantly religious view to one based on the properties of physical substances was at this time signalled by parallel developments in Greece and India, where the Charvaka school's skepticism promoted perception as the primary and proper source of unconditionally true knowledge, so that man was to "give precedence to that which meets the eye

¹¹² Nidhal Guessoum, *Kalam's Necessary Engagement with Modern Science*, Kalam Research & Media, Dubai 2011.p.3.

¹¹³ This , for instance, is the definition in its broadest terms given by the UK Science Council. <http://sciencecouncil.org/about-science/our-definition-of-science/>.

¹¹⁴ The anonymous author of the *Edwin Smith Papyrus* describes anatomical, physiological and pathological observations on 48 cases of injuries, fractures, wounds, dislocations and tumours, and presents a rational and scientific approach in which magic is not allowed to conflict with observation. The *Diagnostic Handbook* by the scholar Esagil-kin-apli demonstrates sophisticated diagnosis, prognosis, and physical examination of the patient.

and turn your back on what is beyond our knowledge.”¹¹⁵ Some developments here in atomism theory parallel those of Democritus, who sought to demonstrate that the material universe was formed not by a Supreme Being, but by the mixing of elemental particles that had existed from all eternity governed by certain simple laws. Epicurus in the third century BC laid emphasis on the proto-scientific method based on human observation and the verification of natural laws while his contemporary Aristotle was the first to systematically categorize and subdivide knowledge into independent disciplines (physics, poetry, zoology, logic, rhetoric, politics, and biology). Aristotle’s *Posterior Analytics* defended the process of empiricism as a necessary demonstration from axioms known with certainty.

The strong contribution of the Arab-Muslim to the developing scientific method is demonstrated, for example, by the above-mentioned Ibn al-Haytham’s unique employment in the eleventh century of a consistent scientific methodology (in the modern sense) based on the observation and measurement of phenomena, the testing, correction and integration of previous knowledge, the formulation of hypotheses and the all-important search for evidence that might nullify the hypothesis. The experimental method was also in evidence in the work of his contemporaries. Ibn Sīnā discussed in his *Kitāb al-Shifā’* a philosophy of science and a prototypical scientific method of enquiry that improved upon Aristotle’s induction; Abū Rayhān al-Bīrūnī went further than Ibn Sīnā’s philosophy-influenced method and, as a ‘mathematical scientist’, insisted on field experience and the importance of quantitative analysis through multiple observations and the principle of ‘universals deriving from practical, experimental work’. In their prioritising of scientific skepticism and empiricism, the work of these eleventh century scholars is held to mark effectively the dividing-line between pre-scientific and scientific methods of enquiry.

An important stimulus to the development of scientific methodology was provided by the disentanglement of the religious and mundane spheres of knowledge. The process gained pace in the twelfth century with Ibn Rushd’s filtering out of neo-Platonic diversions from Ibn Sīnā’s Aristotelian commentaries and his defense of non-sacralised approaches to the understanding of phenomena. Though ultimately unsuccessful in the Muslim world¹¹⁶ his oeuvre was taken up by European scholars, the ‘Averroists’, to lend support to the ‘radical Aristotelianism’ that was emerging in the thirteenth century and promoted by scholars such as Siger of Brabant and Robert Grosseteste. Siger went beyond Ibn Rushd’s conclusion that there were two ways to achieve truth and instead claimed that there existed two entirely separate truths: a factual or ‘hard’ truth established through science and philosophy, and a ‘religious’ truth attained through faith. Grosseteste is noted for his proto-‘predictions’ category (generalising from particular observations into a universal law, and then back again from universal laws to a prediction of particulars).

It is with Roger Bacon – who studied Ibn al-Haytham’s and Robert Grosseteste’s methodologies in detail – that we come to the first systematic theorisation of the scientific method as a set of universally applicable principles. These included a repeating cycle of observation, hypothesis, experimentation, and the need for independent verification. Importantly, he highlighted the importance of repetition, recording the manner in which he conducted his experiments in precise detail so that others could independently test his results. Following his work, the scientific method began to be established as the only credible form of investigation, and by the close of the seventeenth century virtually all of the features characterising modern science were established and institutionalised.

The historical record shows that the term ‘Scientific Revolution’ is less useful than something which could describe an *evolution* of scientific practice. This evolution synthesized the collected labours of predecessors (“standing on the shoulders of giants” as Newton put it¹¹⁷) and

¹¹⁵ From the the *Ramayana*, *Ayodhya kanda*.

¹¹⁶ In 1195, in the town square of Cordoba, 108 of Ibn Rushd’s books were incinerated and the teaching of philosophy was banned. As one of the greatest interpreters of Aristotle, Ibn Rushd had a far greater impact upon Medieval Europe and most of his works survived due to their preservation there in Latin or Hebrew translation.

¹¹⁷ “If I have seen further it is by standing on the shoulders of Giants” from Isaac Newton’s *Letter to Robert Hooke*, 1675.

progressively steered them towards a consistent method that could provide mathematical and experimentally derived proofs for theories that were often anciently recorded, such as atomism and heliocentrism. The mechanisms for establishing those proofs – in this case Arab-Indian trigonometrical methods and Indian place-value number system (along with the zero) upon which Copernicus relied for his computations – are part of a global intellectual heritage.

The emergence of the necessary intellectual and institutional infrastructures for scientific progress and the domination, since the seventeenth century, of western scientific endeavour, however, is another matter. This was very much a process and a product, as we saw, of the systematisation that was able to occur due to political, legal, intellectual and cultural conditions that obtained uniquely in Europe since the thirteenth century. “The revolution itself was not a mere adding of notions from diverse cultures”, concludes Arun Bala in his thought-provoking study on the *Dialogue of Civilizations in the Birth of Modern Science*,

The makers of the revolution – Copernicus, Kepler, Galileo, Descartes, Newton, and many others – had to selectively appropriate relevant ideas, transform them, and create new auxiliary concepts in order to complete their task... In the ultimate analysis, even if the revolution was rooted upon a multicultural base it is the accomplishment of Europeans in Europe.¹¹⁸

It is this accomplishment, this systematisation and conducive climate, as outlined in the previous section, which provides the justification for the present *Model Curriculum's* focus on comparative cultural studies.

Why the natural world became the exclusive focus of science

Much as Ancient Greek thinkers battled for the separation of the divine from the physical, groping for an explanation of the world about them that avoided the gods of myth, and substituted alternatives based on the properties of physical matter – variously ‘water’ or ‘air’ and later towards a more generalised conception of ‘nature’ – so the scholars of the medieval Islamic world struggled to emancipate the explanation for the way the world works from the grip of metaphysics and tussled with the conception of an active, in-working divinity or one that was the ultimate creator and author of a universe that operated according to its own laws. The perception that there was more than one intellectual vocabulary for this debate, and that it was not constructive to mingle the two, led to acrimony among scholars. Al-Bīrūnī and Ibn Sīnā, for instance, had cause to criticise al-Rāzī, dubbed ‘the greatest physician of the Middle Ages’ not for his medical works but for the fact that he “meddles in metaphysics and exceeds his competence. He should have remained confined to surgery, for he exposed himself and showed his ignorance in these matters”.¹¹⁹ Al-Ghazālī himself lamented the lack of separation:

The man who excels in one art does not necessarily excel in every art. It is not necessary that the man who excels in law and theology should excel in medicine, nor that the man who is ignorant of intellectual speculations should be ignorant of grammar. Rather, every art has people who have obtained excellence and pre-eminence in it, even though stupidity and ignorance may characterize them in other arts. The arguments in elementary matters of mathematics are demonstrative whereas those in theology (or metaphysics) are based on conjecture. This Point is familiar only to those who have studied the matter deeply for themselves.¹²⁰ xxii

Although al-Ghazālī was more concerned to devalue the status of the scientist by this comparison, his life-long investigations into the nature of the relationship of physics/metaphysics taught him that the language of the one could not be the language of the other. The language of the senses, even of reason itself, could not lead to certain knowledge: the philosophers’ metaphysical arguments could not stand the test of reason any more than the certainty of

¹¹⁸ Arun Bala, *Dialogue of Civilizations in the Birth of Modern Science*, Palgrave Macmillan 2006, p.176.

¹¹⁹ Rafik Berjak, *Ibn Sina-Al-Biruni Correspondence, (Al-As'ila wal-Ajwiba)* Foundations of Astrology, Classical & Medieval Texts, The Medieval Arabic Era, 2005, Part II, Paragraph 16.

¹²⁰ W. Montgomery Watt, *Op. cit.*, pp.21-22.

revelation could be seen to be based upon reason. Al-Ghazālī's solution was to admit the inadequacy of mingling the two endeavours and seek the revival of Islam by reconstructing the religious sciences upon the basis of Sufism, giving a theoretical foundation to the latter under the influence of his philosophical training.

By recognising the separation of the natural and divine sciences, that scripture's intention is to "teach us how to go to heaven, not how heaven goes"¹²¹ Galileo argued that a new conceptual language had to be learnt, since the 'Grand Book' of the universe

cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures without which it is humanly impossible to understand a single word of it; without these, one wanders about in a dark labyrinth.¹²²

By confining the tools of investigation to a methodological naturalism, to a pragmatic and efficient explanation of natural phenomena exclusively from natural causes, leaving out altogether any appeal to supernatural agents (often termed 'Occam's Razor'¹²³ or the 'principle of parsimony' whereby one is to select the explanation with the simplest and fewest assumptions), the scientific endeavour was able to progress, accelerate and accumulate. It also expelled from its mode of thinking any consideration of progress toward a goal or a target, and particularly the concept of purpose. The lack of certainty that this leaves behind is the arena for teleological speculation, a theological discourse that in both the Christian and Islamic heritage has been highly productive and creative, but it is not an invalidation of science itself – for science does not require 'certainty'. As Bertrand Russell put it:

It is not what the man of science believes that distinguishes him, but how and why he believes it. His beliefs are tentative, not dogmatic; they are based on evidence, not on authority or intuition.¹²⁴

In fact what marks out the progress towards the scientific method was the establishment of the propriety of *doubt*. Once it was established that the goal of the quest for knowledge could not be the ultimate proof of the accuracy of a hypothesis, but rather its *provisional* superiority to other hypotheses in the face of challenge, and that this provisional nature did not impugn its authority, once 'science' came to be conceived primarily not as a *body* of knowledge, but as an *approach* to knowledge or 'a way of thinking', the remarkable intensification of investigative endeavour and its achievements that took place in the seventeenth century Europe became feasible.

¹²¹ The famous phrase *ci insegna la via per andare in cielo, non come il cielo sia fatto* occurs in a letter of 1615 to Madame Christine of Lorraine, Grand Duchess of Tuscany. The letter repeated, in Galileo's defence, the concepts already expressed by defenders of the Copernican theory, as well as the entreaty by some of the Church authorities that one avoid the risk of presenting as religious doctrine a question that pertained only to the sphere of the natural sciences. See J.D. Moss, 'Galileo's Letter to Christina: Some Rhetorical Considerations', *Renaissance Quarterly*, Vol. 36, No. 4 (Winter, 1983), p.566.

¹²² Galileo Galilei, *Il Saggiatore (The Assayer)*, tr. Stillman Drake (1957), *Discoveries and Opinions of Galileo ('The Assayer')*, Doubleday, New York 1957, pp. 237-8.

¹²³ So named from William of Ockham (c. 1287–1347), who was an English Franciscan friar, scholastic philosopher, and theologian. The preference for simplicity that this formula advocates is based on the falsifiability criterion, aimed at preventing the presentation of ever more elaborate *ad hoc* explanations to prevent the hypothesis from being falsified.

¹²⁴ Bertrand Russell, *Op. cit.*, p.527.

RESULTS: diagnostic conclusions from the comparison

The developments and attitudes that led to European success were not replicated in the Islamic world. In the light of the above, it may be useful to highlight some of the operative elements that led to the different outcome.

The damage of cultural quarantine

The first is an ambiguous attitude towards the cultural product of non-Islamic peoples particularly where these touched on matters perceived to be core to the faith – a lack of curiosity symbolised by Ibn Khaldūn's cursory and dismissive reference, mentioned earlier, to “reports of the philosophical sciences greatly cultivated in the land of Rome.”¹²⁵ xxiii We saw, conversely, that in Europe the intermingling of intellectual endeavour, both from sources hailing from an earlier pagan age and from cultural traditions foreign to Europe – even from the realm of the religious foe – demonstrates the imperviousness of scholarly endeavour at the time to any reservations about cultural ‘contamination’. There was no elaborate industry promoting ‘cultural authenticity’ in the face of a more developed culture.

This is an important lesson for educationalists today. Understanding that the Greek heritage was already considered part of their cultural patrimony for Christian Europe, is not a case for excepting the Islamic Middle East from this trajectory but rather one for taking equal ownership of the patrimony of a civilisation that, at one time, was the dominant idiom on either shore of the Mediterranean. There is a commonality of philosophical heritage, and this commonality should be allowed equally to inform the intellectual infrastructures of doctrine.

The value of rationalism

The second element is the historical record's demonstration that the translation and distribution of works promoting the rational approach to knowledge, and the integration into the educational syllabus in all faculties, of methodologies training *how* to think rather than *what* to think, has the power to effect a revolution that can transform the entire nature and course of development and progress. The parallels with the current state of education today in the Middle East are not far-fetched, if one keeps in mind the qualitative, rather than quantitative, changes that are demanded for a similar revolution to take place, to galvanise what is a considerably larger and more highly motivated energy pool available in the region.

The necessity of the ‘separation of church from state’

The third element is the value, not only in terms of politics but also in intellectual productivity, of the ‘separation of church from state’. Islam's failure to do this effectively nullified an institutional advantage that it potentially had over Western Christendom. The lack of a centralised, hierarchical system in wielding ultimate power over believers might have been expected to promote freedom of enquiry and the cultivation of a vibrant, sustained philosophical endeavour leading to the development of scientific methodology.¹²⁶ But it seems the reverse occurred: it was the West that went on to develop a lively natural philosophy, whereas in Islam natural philosophy became a peripheral and suspect discipline, whose study could even prove dangerous.¹²⁷ In this respect, the separation of church and state – an integral part of Western Christianity from its outset – was of momentous significance since it made numerous institutional

¹²⁵ Ibn Khaldūn, *Muqaddima*, Section 13, *On the Various Kinds of Intellectual Sciences*. الباب السادس من الكتاب الأول، الفصل الثالث عشر، في العلوم العقلية وأصنافها

¹²⁶ The argument has been made that in the earlier period the lack of institutional support for science allowed Arabic thinkers such as al-Farābī (c.870-951) to be bolder than their European counterparts. But it also meant that many Arabic thinkers relied on the patronage of friendly rulers and positive conditions that remained ephemeral. See H. Ofek, ‘Why the Arabic World Turned Away from Science’, *The New Atlantis, A Journal of Technology and Society*, Winter 2011, p.19.

¹²⁷ Edward Grant, *Science and Religion*, p.247.

developments feasible that might not otherwise have occurred. “The very separation of natural philosophy,” argues Edward Grant,

into the faculty of arts and the location of theology in a separate faculty of theology reveals an understanding that these are different subject areas that require very different treatment. The greatest benefit for science and religion is that each was left relatively free to develop independently of the other, although every individual scientist or theologian was free to incorporate ideas and concepts from the one area into the other... The separation of church and state, and the analogous disciplinary distinction between theology and natural philosophy, made possible the independent development of each of these two fundamental disciplines ... [and] .laid the foundation for the great scientific advances made in the sixteenth and seventeenth centuries, advances that have continued to the present day.¹²⁸

The marginalization of natural science in the madrasa

Instead, the perception that the study of natural philosophy could not be allowed free exercise to develop, for fear of encroaching upon other more sensitive disciplines, generated a climate often of overt hostility so that the name *ḥaylasūf* (‘philosopher’) frequently came to be used as a term of insult. Relegated, at best, to a peripheral activity, the subject was progressively removed from the syllabus of the *madrasa*, which saw its primary function as one defending orthodox belief. This was in part a question of the lack of legal autonomy. *Madrasas* were established under the law of *waqf*, or pious endowments, which meant they were legally obligated to follow the religious commitments of their founders. As we have seen, Islamic law did not recognise the concept of a corporate entity as a ‘juristic person’, and this precluded the development of independent scholarly institutions that could foster intellectual disciplines outside of the religious orthodoxy. The exclusion of science and mathematics from the *madrasas* also suggests that these subjects were statistically marginal in medieval Islamic education. Though promoted by individuals of genius, they were never officially institutionalized and sanctioned by the intellectual elite of Islam. This meant that when intellectual discoveries were made, they were not picked up and carried by students, and did not influence later thinkers in Muslim communities. Little attention, for instance, was paid to Ibn Rushd following his expulsion from Spain, until Europeans rediscovered his work.¹²⁹

The judgement of history

The evidence of history is unequivocal. Medieval scholarship from the 9th to the 15th centuries produced a rich and creative literature that sought answers to the competing polarities of authenticity and exploration. But the prioritisation of one school on a wing of the spectrum that prioritised tradition – Ash‘arism – to the near-exclusion of others,¹³⁰ together with the openly secondary status it accorded reason, had a negative effect on creativity in both the theological and philosophical fields. Later, even this strongly delimited space for philosophical argumentation was eliminated with the rise of scripturally literalist currents under the influence of figures such as Ibn al-Ṣalāḥ al-Shahrazūrī who sought to outlaw the mechanisms of logic¹³¹ and the Ḥanbalī

¹²⁸ Edward Grant, *Op.cit.*, p.248.

¹²⁹ H. Ofek, *ibid.*

¹³⁰ The Ḥanbalī legal school that opposed the intrusion of Greek rationalism *tout cour* into the discussion, with Ibn Taymiyya as their most famous proponent, also emerged from this period intact, and to a large degree has gained in influence since the ‘Islamic Awakening’ of the 1970s. A primary source for the opposition to *kalām* is ‘Abdallāh al-Anṣārī’s *Ḍamm al-Kalām wa-Ahlih* (‘The Condemnation of Kalām and its Proponents’) that includes the following typical denunciations from leading traditionalist scholars: “If you see a man loving *kalām*, then warn against him!” (Aḥmad ibn Ḥanbal) or “Whoever seeks the religion through *kalām* becomes a *Zindīq*” (Imām Mālik) or “There was no *Zandaqa*, nor *Kufr*, nor *Bid’a*, nor temerity in the religion, except by way of *kalām*, disputation and hypocrisy” (Ibrāhīm al-Khawwās).

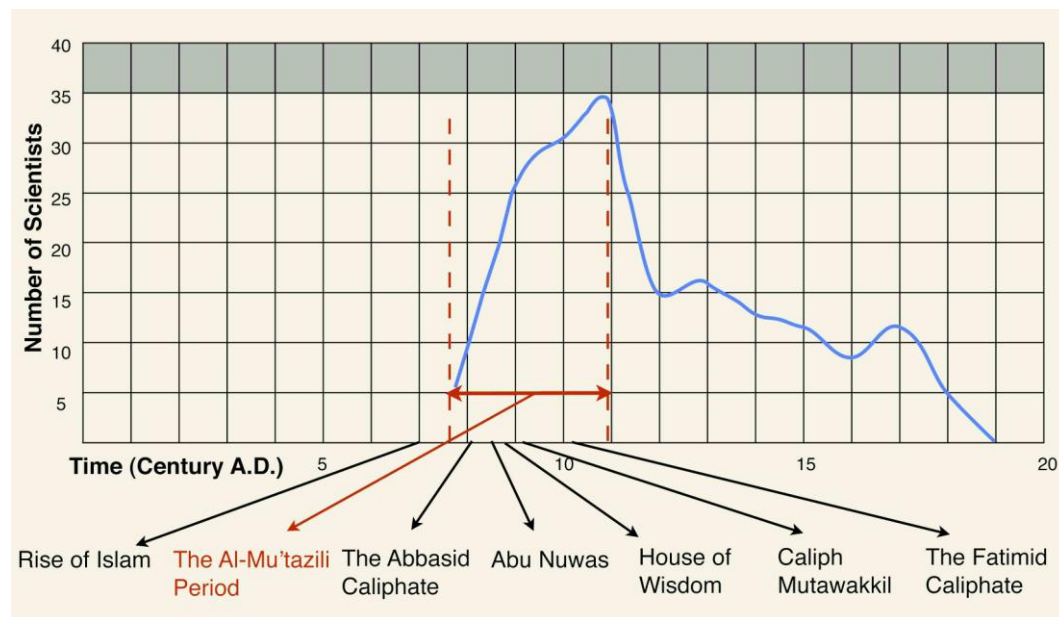
¹³¹ Ibn al-Ṣalāḥ’s prohibition was on the grounds that “it is an entry-point for philosophy, and any entry-point for evil constitutes itself an evil. Occupying oneself with teaching or learning it is not licensed by Islamic law, nor did any of the Companions and Ṭābi‘īn permit it, nor the founding imams of law, nor the pious ancestors, nor any other prominent figures of the Islamic Nation or its leaders; God spared all from the contamination of knowing this, and cleansed them of its harmful effects.” See A. Qal’ajī *Op. cit.*, p.210.

scholar Ibn Taymiyya, who argued against the permissibility altogether of the disciplines of philosophy and theology.

The result was not only the expulsion of philosophical argumentation from the scholars' toolkit but an increasing assumption, and hence delimitation, of the utilitarian purpose of scholarly endeavours with respect to matters of belief, which were to be accepted and practiced only to the extent that they were legitimated by the instrumentalist view of what was useful to the Muslim and his faith. If something does not have an immediate benefit, and that benefit cannot be demonstrably justified in the Sharī'a, it was considered superfluous.¹³²

The statistical evidence of the decline

The two principle operative factors in the rise and development of science are economic development and intellectual freedom. The historical record speaks eloquently of the pivotal role of the second, of the constraints placed, due to the perspective of orthodox religious thinkers, upon the free exercise of the intellect and the development of rational philosophy. Dr. Mohammed al-Sanduk has demonstrated that there is a statistical relationship between the conditions of free enquiry and scientific achievement. His statistical analysis¹³³ traced the scientific output over the course of Islamic history, to demonstrate that following the efflorescence of Arab-Islamic science in the first three centuries of Islam, the major factor powering the eight-century long decline is attributable to the domination of religious thought over Muslim societies.



The relationship between freedom and scientific progress as expressed in scientific output (M. al-Sanduk)

While acknowledging the natural influence of social and economic problems caused by conflict and natural disaster (and in view of the highly unfavourable experience of Europe in these respects) he concludes that these are far less significant a conditioning factor. The most important factor for that catastrophic retardation, he concludes, is the absence of the freedom of thought and belief:

¹³² According to A.I. Sabra, "The naturalisation of the Greek sciences in Islam may be understood as a process in which the philosophers' view of knowledge was replaced by the instrumentalist view proposed by Ghazālī" and the decline of science "set in when the sciences came to be accepted and practised only to the extent that they were legitimated by the instrumentalist view." See A.I. Sabra, 'The Appropriation and Subsequent Naturalization of Greek Science in Mediaeval Islam: a Preliminary Statement', *History of Science* XXV (1987), pp.223-43. Reprinted in F. Ragep and S. Ragep (edd), *Tradition, Transmission Transformation, Proceedings of Two Conferences on Pre-modern Science held at the University of Oklahoma*. E.J. Brill, 1996, p.24.

¹³³ Mohammed al-Sanduk, *The Influence of Freedom on Growth of Science in Arabic-Islamic and Western Civilizations*, PhilSci Archive, 2009. <http://philsci-archive.pitt.edu/4766/>. See also Mohammed al-Sanduk, 'Freedom and the Progress of Civilisation', *Almuslih.org*.

The transference of knowledge is one of the drivers of development in science and human knowledge in general. Whenever this knowledge finds a fertile, suitable environment, it settles for a longer period of growth. This is what has taken place over human history and continues to be the case.¹³⁴

The value of comparative cultural studies

This is where the value of comparative culture studies lies: the mere observation of the European experience in establishing the creative relationship between reason and revelation provides the pointers and justification for educational reform. Arab educationalists of today – that is, those of a more accomplished cultural bilingualism – are able through this study of comparative culture and comparative religion to discern whole new vistas of opportunity, with the wisdom of hindsight that Europe’s laboratory experiment provides.

Understanding the commonality in the dialectic between faith and reason

An educational syllabus that includes modules on comparative cultural studies reveals the commonality of the faith/reason debate, underscores that there is an intellectual and philosophical infrastructure to science and technology, and demonstrates how the resolution of the debate has a direct effect upon the trajectory of progress. By recognising the commonalities in this relationship, the student will remain open to examining and understanding the intellectual infrastructure of modern culture, as one that has not been specifically designed to counter some putative ‘Islamic’ epistemology. Ultimately, it dispenses with the irrelevance of opposing modernity on the grounds of its un-Islamic ‘western’ or ‘un-Islamic’ pedigree, and dispenses with the Quixotic enterprise of attempting to ‘Islamize’ science as an attempt to retain a mythical authenticity and self-sufficiency of Islam, as if Muslims constituted some separate form of humanity unto themselves. The effect will be to combat the intellectual quarantine, reduce the cultural narcissism and antagonism, and thus justify an untroubled participation in modernity as something other than a surrender to ‘Judeo-Christian values’.

Demonstrating the falsity of the authentic / inauthentic polarity

Comparative cultural study demonstrates the invalidity of the false authentic/inauthentic polarity that current educational perspectives promote, whereby the Arab Muslim legacy is presented, as mentioned earlier, as one of crude opposites, the authentic versus the inauthentic, the local versus the foreign. Such a study helps, by means of the laboratory experiment, to establish the relative weight to give to innovation and ‘heritage’. Can a Europe populated by museums and galleries, for example, be said to be deprived of heritage? Or, rather, has its ‘cultural secondarity’ status strengthened its love of heritage? And not only its own heritage, but that of others too – witness the origination and development of the disciplines of Islamic archaeology and conservation, or the endeavours of Champollion or Rawlinson¹³⁵ in introducing to the contemporary citizens of the Middle East the voices of their ancient ancestors.

The question the student is confronted with is this: is authenticity compromised by innovation? Has the obligation, codified by Ibn Taymiyya in his *Iqtidā’ al-Ṣirāṭ al-Mustaqīm*,¹³⁶ to “oppose the inhabitants of Hellfire even if what they had would benefit us” stood the test of time? When looking at the experience of European history, can one speak of a less ‘authentic’ culture for its having enthusiastically sought knowledge and insight wherever it could find it? By the year 1200 Oxford and Paris had curricula that included Latin translations of Arabic commentaries on Aristotelian science, compendious medical encyclopaedias such as Ibn Sīnā’s *Al-Qānūn fī al-Ṭibb* (‘Canon Medicinae’), al-Rāzī’s *Al-Hāwī fī al-Ṭibb* (‘Continens Rasis’) and *Al-Kulliyāt fī al-*

¹³⁴ Mohammed al-Sanduk, ‘Freedom and the Progress of Civilisation’, *Almuslih.org*.

¹³⁵ Jean-François Champollion deciphered in 1824 the Egyptian hieroglyphics of the famous Rosetta Stone and Henry Rawlinson in 1837 deciphered the Old Persian cuneiform of the Behistun Inscriptions in Iran, the first step on the road to uncovering the cuneiform literatures of Babylon and Sumer.

¹³⁶ Ibn Taymiyya, اقتضاء الصراط المستقيم مخالفة أصحاب الجحيم (‘Cleaving to the Straight Path means Opposing the Inhabitants of Hell’).

Ṭibb ('Colliget') of Ibn Rushd, along with astronomical treatises such as al-Farghānī's *Kitāb fī Jawāmi' 'Ilm al-Nujūm* ('Chronologica et Astronomica Elementa'), all of them not only taught openly but formally incorporated into the university syllabus. Such an overview of the borderless interaction of the scientific endeavour led J.D Bernal to the conclusion that, practically speaking, it would be more informative to divide up the history of the development of science in a different way:

It would [be] more logical to treat together as one chapter of intellectual advance the whole period from the seventh to the fourteenth century, hardly distinguishing the languages – Syriac, Persian, Hindi, Arabic, or Latin – in which the books were written. The difference between the new science of the sixteenth century and that of the thirteenth in Europe is far greater than that between Arabic and Latin science in the twelfth century.¹³⁷

This is where the signal value of comparative culture studies lies: it underscores the importance of a new historiographical approach that assumes, as with Europe, cultural secondarity, and roots Islamic civilisation not only within its historical or geographical context in the world of Late Antiquity, but also within its theological context, dispensing with the destructive, artificial, de-parenting concept of *jāhiliyya* that isolates, and orphans contemporary Muslims. The value in this approach for developing a recognition of the Other in an environment of increased communication and interaction with a plurality of cultures and faiths, is self-explanatory. Comparative cultural studies, applied in depth, are therefore crucial ingredients in the reformation of the educational curriculum to

- a) understand the essential commonality of the constituent ingredients of modernity and
- b) understand the mechanisms that led to the respective scientific destinies of Europe and the Middle East.

By grasping these elements the student will be able to make a distinction between a failing of *methodology* over against some unproven 'essential' feature of Islam as a faith that must in some way provoke confusion, antipathy and disassociation in the face of a globalising common culture of modernity. This informed capacity will resolve in the contemporary students any complexes of guilt associated with making a reconciliation with modernism, "cleansing it of the obstructions that have impeded their integration into the world in which they are living by adopting its institutions, its sciences and its modern values."¹³⁸ For the experience of Christian Europe demonstrates that there is no essential diminution of the fabric of faith in a philosophical approach to religious belief, but that it is possible to invent one if the position is taken that it entails a diminution of the omniscience and omnipotence of the divinity.

¹³⁷ J.D. Bernal, *Science in History, Vol.1: The Emergence of Science*, Penguin, London, 1969, p.284.

¹³⁸ Lafif Lakhdar, *The Reform of Islam is both Necessary and Possible*, Almuslih.org

The contemporary debate on Islam and science

Vestiges of the pre-scientific view persist today in the contemporary Muslim world

Despite the overwhelming evidence of its success as a method, and the demonstrable impoverishment, in comparison, of pre-scientific views of the universe, the focus of modern science on natural phenomena – unalloyed with metaphysics – continues to meet with challenge in the Muslim world. A key feature of this pre-scientific mindset was the statistical lack of importance given to the origin and nature of the material world in comparison to its incidental role as theatre for the narrative of the moral story underlying creation. Critics of the condition of education in the Middle East today note the persistence of this focus, so that “even the mathematics teacher turns his subject into a preaching lesson.”¹³⁹ ^{xxiv} The framework for contemporary science continues to pose a challenge for many Muslims to a number of their conceptions on the world and nature, and these believers, as Nidhal Guessoum observes,

insist that God acts physically and directly in the world, in cases of miracles ... or in everyday events, either on large scales (earthquakes, floods, etc.) or small, individual, personal scales ... It also has serious implications on the explanations that one may propose to certain phenomena around us, ranging from volcano eruptions to sudden deaths or illnesses suffered by various people, especially sinners.¹⁴⁰

“From that,” he concludes, “one understands why the relation between Islam and modern science is not, and cannot be, trivial”.¹⁴¹

The claim to a separate identity for Muslim science

Guessoum’s concern is that with this type of thinking the Muslim is being encouraged to transport himself back to a pre-seventeenth-century conception of the world and its nature, and approach the issue of science and knowledge increasingly as one of *identity*. This has spawned a curious interpretation of the historical record of the rise of science: to account for the hiatus in scientific productivity in the Islamic world, the triumph of contemporary science is written off as missing the point and purpose of ‘true’ knowledge. Under this interpretation, while the ‘true’ science under Islam had an essential influence on the Western world up to the time of the Renaissance, after this Europe became, literally, dis-orientated and pursued an aimless path of empirical, materialist science without God to show them the way. The argument, proposed by of Seyyed Hossein Nasr, is that “the spiritual forces of Islam were always strong enough to preserve the hierarchy between intellect and reason, and thus to prevent the establishment of a rationalism independent of the revelation.”¹⁴² The very elements of the Islamic sciences, he maintains, which were responsible for providing the West with its tools,

became secondary in the Islamic world itself and had already ceased to occupy the main intellectual efforts of that civilization by the ninth/ fifteenth century.¹⁴³

Having thus bequeathed the tools to Europe, this argument runs, Muslims are then to have decided that these tools were secondary to Islam’s true purposes. So while Europe excitedly ran off like a child playing with new-fangled toys, Muslims are to have withdrawn to concern

¹³⁹ “When it comes to education we find that we focus on establishing the ideas we have inherited. Even the maths teacher turns his subject into a preaching lesson. We need to get rid of that.” Ibrahim al-Buleihi, *World Government Summit*, 4:49.

¹⁴⁰ Nidhal Guessoum, *Kalam’s Necessary Engagement*, p.5.

¹⁴¹ Nidhal Guessoum, *Op. cit.*, p.3. “Muslim preachers,” Guessoum goes on to warn, “may wish to reconsider their explanation of some mental disorders as demon possessions, and so on. In fact, explanations that include the ‘sin’ factor, for instance, can be falsified (in the Popperian sense) by looking for statistical correlations (or lack thereof) between the sample of afflicted individuals and their religious beliefs and behaviors.”

¹⁴² Seyyed Hossein Nasr, *Op.cit.*, p.27.

¹⁴³ Seyyed Hossein Nasr, *Op.cit.*, p.39.

themselves with loftier things, so that “the tide of Islamic thought was flowing back, as before, into its traditional bed”, and

the sciences came to possess instead a stability and a ‘crystallization’ based on the immutability of the principles from which they had issued forth; it is this stability that is too often mistaken in the West today for stagnation and sterility.¹⁴⁴

Islam’s role in science, therefore, is to have been altogether of a higher level than these material aspects.

Under this false identity preoccupation science and knowledge, ultimately, are to be revealed and explained by Islam, and the historical contribution of Muslim scientists explained not with reference to the methodology which they employed, but to their *religious confession*. Their work should be studied, according to Ahmad Tarabishy, in order “to restore confidence to the Muslim Ummah, to remind believers what is needed to be great again” and set a suitable, Islamic, paradigm for the scientist of today. “Studying the lives of the Muslim scholars”, he maintains,

provides modern-day Muslims with a portrayal of the prototypical modern scientist. He is one who devotes his efforts to discovering Allah’s signs in this world and who tries to direct his or her discoveries to those that produce social benefit ... The purpose of knowing the natural world in Islam is to reveal the signs that Allah set in his creation.¹⁴⁵

Not only is the student hereby launched back to a world that does not portray a prototypical modern scientist, he is to operate in one that Arab scholars such as Al-Farābī and Ibn Rushd did their level best to challenge: the world of the fixed immutable source and validation of knowledge.¹⁴⁶ As a result, the utilitarian and identitarian formula from the period when scientific endeavour declined, is being repeated today. The ultimate expression of this dead end, as we have seen, is the sterile ‘Islamisation of science’ enterprise with all the damage that does both to science and to Islam.

If the response to the challenge of modernity, as it manifests itself in scientific endeavour, is to seek an alternative like this to science altogether and, as the *UN Arab Human Development* reports, “abandon the intellectual basis that underpinned the Arab classical cultural experience”¹⁴⁷ we are faced with a disregard of reality that will have tragic consequences for the region.

Students of the 21st century will be required to re-set these priorities if they are to repair the intellectual future of the Islamic world and animate a cultural recovery not only in the natural sciences but also in the religious sciences of Islam. Comparative cultural studies offer Muslim reformers the prospect of re-enacting this new approach, of applying the same methodologies to themselves – with the same productive results.

The debate on the harmony of Islam and science

Beyond the issue of the identity pre-occupation with modern science stands the relationship between faith in Islam and the natural sciences themselves. The subject has remained inchoately treated ever since Shaykh Rifā‘a al-Ṭaḥṭāwī and his colleagues in the nineteenth century set the pattern by presenting the science which they had witnessed in Europe

not as an *episteme* but as a *techne* through highlighting the significance of technological achievements and improvements in daily life, regardless of the theoretical and paradigmatic traditions underlying these technological achievements. Science was perceived as a neutral

¹⁴⁴ Seyyed Hossein Nasr, *Op.cit.*, p.21.

¹⁴⁵ Ahmad Bakir Tarabishy, ‘Why Have Muslim Scholars Been Undervalued Throughout Western History?’ <http://www.islamfortoday.com/scholars.htm>.

¹⁴⁶ While Greek philosophy was based on the developing contours of knowledge, Nasr proposes that in Islam “the arts and sciences came to possess instead a stability and a ‘crystallization’ based on the immutability of the principles from which they had issued forth; it is this stability that is too often mistaken in the West today for stagnation and sterility.” Seyyed Hossein Nasr, *Op.cit.*, p.21.

¹⁴⁷ UNDP, *Arab Human Development Report* 2003, 118.

technical practice, which was coincidentally attached to certain intellectual and social practices in Europe.¹⁴⁸

Indications of the difficulty of the graft caused by the failure to grasp the *episteme* dominated the academic arena over the twentieth century and the debate on the harmony of Islam and science remains amongst the most important and lively ones taking place in the Muslim world. What is noticeable in this debate is the level of confusion that persists in this relationship. The lack of clarity, as Nidhal Guessoum observes,

is the reason why thousands of Muslim scientists are in fact technicians who are competent in some narrow area but have no knowledge or understanding of the bigger picture; this is also why they very often adopt traditional, or even irrational views on most issues, from Qur'anic healing to *I'jaz*. This further explains the fact that in the (limited) survey that I conducted, I found that Muslim professors were no less, and sometimes more, orthodox (rejecting evolution, for example) than students and the general public.¹⁴⁹

The arena of discussion has been conducted by scholars of varying levels of scientific competence. The range includes the non-scientific starting point of an advocate of an 'Islamic' science such as Isma'il al-Faruqi mentioned earlier. Trained as a philosopher and professor of comparative religion, he opposed science's skepticism as "the success of science which is seen as the continuing victory of the empirical, over the religious mind."¹⁵⁰ Wishing science to shift from a form which he considered unsound and detrimental, to a new and ideal status of science, al-Faruqi took a partisan view of the respective approaches of the Christian and Muslim faiths to science,¹⁵¹ effectively blaming the former for providing a theological underpinning to skepticism.¹⁵² Al-Faruqi's formula for science's ideal status has difficulty in accommodating science's highly fluid internal dynamics of change and revision, and since its inception in the late 1970s the Islamisation of science project has receded somewhat from the cultural and intellectual landscape of most of the Islamic world.¹⁵³

Closely allied to this approach, and progressing with undimmed vigour, are the various manifestations of the *i'jāz* genre of science in the Qur'ān. Here its conspicuous proponents such as the geologist Zaghloul el-Naggar¹⁵⁴ or Maurice Bucaille or particularly in the field of evolution Adnan Oktar (Harun Yahya), are engaged in the exercise of identifying in the scriptures scientific notions or prophecies of modern discoveries and technological innovations.

¹⁴⁸ Ahmed Ragab, *Islam and Science* in J. Haag, G. Peterson and M. Spezio (edd), *The Routledge Companion to Religion and Science*, Chapter 5, Routledge, Abingdon and New York, 2012, p.53.

¹⁴⁹ Nidhal Guessoum, *Islam's Quantum Question*, section 'Educational and Social Issues'.

¹⁵⁰ Ismail al-Faruqi, *Al Tawhid: Its Implications for Thought and Life*, (Chapter IV – The Principle of Knowledge. I. Neither Skepticism nor the "Faith" of Christians), 3rd ed. IIIT, 1995, p.39.

¹⁵¹ Al-Faruqi actually disputes the commonality of the term 'faith' in the first place: "The Muslim should never call his *īmān* 'belief' or 'faith' ... these English words carry today within them an implication of untruth, of probability, of doubt and suspicion ... they mean only that that person or group holds a certain proposition to be true. Never does either term mean that such a proposition is true. Obviously, this is the exact opposite of the meaning of the term *īmān*. This term, deriving from *amm* (security), means that the propositions it covers are in fact true, and that their truth has been appropriated (i.e., understood and accepted) by the mind... They have been subjected to doubt and emerged from the testing confirmed and established as true. No more pleading on their behalf is necessary. Whoever acknowledges them as true is reasonable; whoever persists in denying or doubting is unreasonable." Ismail al-Faruqi, *Op.cit.*, pp.40-41.

¹⁵² "Unlike the faith of the Christians, the *īmān* of Islam is truth given to the mind, not to man's credulity ... Whereas in Pascal's thinking (who argued for faith as a wager), man can never be demonstrably convinced of Allah's existence, of His commandments, and final judgment, Islam has taken up the challenge to give such demonstration." Ismail al-Faruqi, *ibid*.

¹⁵³ The project is nevertheless still being pursued in Washington DC, under the influence of al-Faruqi's International Institute of Islamic Thought, and in Malaysia where the legacy of Seyyed Naquib Al-Attas's work is still strong, and conferences on the Islamisation of knowledge and science continue to be regularly organized.

¹⁵⁴ Dr El-Naggar is chairman of 'The Committee of Scientific Notions in the Qur'ān, Supreme Council of Islamic Affairs' in Cairo and achieved notoriety for his therapeutic advocacy of camel urine (on the basis of the Prophet's recommendation recorded in the *ṣaḥīḥ* hadiths of Bukhārī (2855) and Muslim (1671) and Ibn Sīnā's recommendation in *al-Qānūn fī al-Ṭibb* according to Ibn Taymiyya) and also for his claim that in 1978 NASA had confirmed the splitting of the moon (in conformity with Qur'ān, *Al-Qamar*, LIV 1-2).

While the *i'jāz* genre originated in the Arab world several decades ago, it has expanded almost exponentially across the Muslim world as an interpretation of Islam's role in the phenomenon of science for the élites and the uneducated public alike.¹⁵⁵ The motivation, as Nidhal Guessoum indicates, has a strong admixture of cultural insecurity to it:

Many highly educated Muslims, strongly anchored in the Qur'an as a miraculous divine text, hope to see all knowledge under the command and control of the Holy Book and long for a bygone era when science constituted no challenge to Islam, whether factually or philosophically. The traditionalist school appeals to them emotionally, giving them hope that the Qur'an's supremacy and Islam's dominance can be brought back.¹⁵⁶

Dignified with the technical terms of *i'jāz* *'ilmī* (demonstration of the inimitable scientific miracle of the Qur'ān) and *tafsīr* *'ilmī* (scientific exegesis) the effect, according to critics of the genre, has been to reduce scripture to a repository of scientific notions, or an 'encyclopaedia',¹⁵⁷ as opposed to a book of guidance – with implications, once again, from the problematic fluidity of scientific discoveries (see Ziauddin Sardar's comments below). It has also had the regrettable effect of diverting intellectual energies into a dead end.¹⁵⁸

More nuanced is the work of the above-mentioned Prof. Seyyed Hossein Nasr, a scientist trained in geology and geophysics and specialist in the history of science. Although similarly maintaining the Qur'ān as the root of all knowledge, his less letter-for-letter mining of science in the text and his mystically informed approach (from a position of Traditionalism or 'Perennial Philosophy') places emphasis on the notion of intellect, or intellection. Arguing for the Qur'ān's lack of clear demarcation between the natural and the supernatural, Nasr laments the "excessively tight boundary" between these realms drawn by Christian theologians in reaction to Greek pagan 'cosmolatry' (and subsequently inherited by science in the West) on the grounds that this has led "to an impoverished view of nature." His formula for Islamizing science is less prescriptive than al-Faruqi's but still argues for the integration of science as practiced in the West into an Islamic perspective of a science that is no longer 'divorced from the sacred' and one that can be relied upon to correct the destructive impacts of technology. Problems associated with this approach include the required élite status for the interpreters of this relationship between Islam and science,¹⁵⁹ and the potential clash with a Muslim public that is overwhelmingly literalist and textual in its approach to the scriptures.

A related approach is that taken by the Iranian physicist Mehdi Golshani who similarly dismisses what he terms the 'philosophy' of empiricism and for the same reasons: it expelled metaphysics from science. Golshani pleads for a *non-impartial science* whose theoretical principles are to be Islamic, even specifically Qur'ānic, when these touch upon 'fundamental theories' (such as the origin of the universe or of consciousness) where "meta-scientific assumptions are needed to settle the issues".¹⁶⁰ This is contrasted to the realm of 'intermediate theories' where most

¹⁵⁵ This is thanks to high-profile figures exploiting the potential of the televisual media, such as Adnan Oktar in Turkey and Zakir Naik in South Asia. Its most famous and prolific leader, however, remains Zaghoul El-Naggar, who claims to have published at least three encyclopedias, about 80 (many of them translated into several languages), and to have participated in hundreds of TV discussions and documentaries. Dr El-Naggar claims that he has convinced "a large number of universities in the Arab world" to offer a course on *i'jāz*, and examines PhD theses on the subject. Stefano Bigliardi, *Islam and the Quest for Modern Science: Conversations with Adnan Oktar, Mehdi Golshani, Mohammed Basil Altaie, Zaghoul El Naggar, Bruno Guiderdoni and Nidhal Guessoum*. Istanbul: Swedish Research Institute in Istanbul. p.128.

¹⁵⁶ Nidhal Guessoum, 'Islam and Science: The Next Phase of Debates', p.857.

¹⁵⁷ For a criticism of this see Lafif Lakhdar, 'Is the Qur'ān an encyclopædia of science?', *Almuslih.org*.

¹⁵⁸ There are now even conferences on 'Miraculous Numerical Content of the Qur'an' being organised. "We may be tempted to dismiss this school as a mixture of pseudo-science and naïve exegesis and theology", argues Nidhal Guessoum, "but it is unfortunately still alive and kicking in most of the Islamic world, seducing droves of highly educated and lowly educated people alike." Nidhal Guessoum, *Ibid*.

¹⁵⁹ The exercise is "obviously contingent upon finding interpreters of the Divine intellect, who are presumably to be chosen from among the holy and the pious". See Pervez Hoodbhoy, *Islam and Science, Religious Orthodoxy and the Battle for Rationality*, Zed Books, 1991, p.73.

¹⁶⁰ Mehdi Golshani, 'Comments on 'A Religiously Partisan Science? Islamic and Christian Perspectives,' *Theology and Science* 3:1 (2005), p.89.

scientific work is actually carried out. In this sphere, Golshani maintains, the methodological core of science is already sufficiently defined and cannot be reinvented. He appears to be an advocate of a theistic interpretation of science, in that insofar as Muslims are guided by the sacred book they believe in three fundamental avenues to knowledge of nature: the use of the immediate senses (by means of which observation and experimentation take place), the use of intellect-reason (intuition), and the deriving of some key principles and inspiration from divine revelation. It is unclear to what extent this notion is one of actual non-impartial science – that Islam as a faith has an epistemological content – or whether it is, rather a dependent relationship, one of a fully de-sacralised science over which a layer of metaphysics is imposed, or re-framed as theistic. Nor is it clear as to whether Golshani believes, in his advocacy of a theistic interpretation of science, in Islam's privileged status as the conduit to that science.

Opposition from skeptics

The positions adopted by these scholars have been countered by scientists such as Pervez Hoodbhoy and the Turkish-American physicist Taner Edis, who question the solidity of the historical argument in favour of the harmony of Islam and science. In unequivocally challenging their assumptions, scientists and scholars such as these have not only disputed the scientific validity of their starting-points but have also placed history under scrutiny, examining the social conditions and the role of intellectuals during the High Islamic Civilisation, and concluding that Islam cannot be said to have been a decisive factor in the intellectual development of these outstanding thinkers. Moreover, they

stress that the comparison between the past and the present positions of Islam with respect to the sciences is not tenable, both because those very thinkers held views not in tune with the contemporary ones, and because the science of those days cannot be said to bear an overall resemblance to present day one. In this sense, the whole historical side of the discourse [of the] harmony of Islam and science is deconstructed and rejected as the ideological exploitation of a fictional past.¹⁶¹

Dr Edis sums up the historical record by agreeing that Muslim thinkers did more than just preserve Greek science, but considers that it is more accurate to consider their work 'proto-scientific', never quite having made the breakthrough (the 'Scientific Revolution') that took place in Europe. He holds that the Muslim world's continuing obsession with its 'fabled' past merely gets in the way of developing a living scientific culture, since classical Islamic thought was, and is, unable to accommodate a modern scientific understanding based on experimentation, quantification, prediction and falsifiability.¹⁶² These challengers to the popular consensus on the relationship assert that science and religion have separate spheres and that religious doctrines should not be permitted to interfere with science altogether. For Nidhal Guessoum the call for a qualitative rather than quantitative science, as exhibited in the work of Seyyed Hossein Nasr,

relies on vague principles; intuition of the divine, even if it is given credibility, does not enter into the process of scientific knowledge. Science is already universally and objectively defined and needs no supplementary conceptual infusions, nor does it require a new foundation; at the same time, the existence of theoretical guiding principles that transcend the facts and guide investigation opposes any metaphysically deflationist or reductionist view of science.¹⁶³

The search for scientific notions in the Qur'ān therefore risks engendering pseudoscience and a misunderstanding of the methods of science itself.

¹⁶¹ Stefano Bigliardi, 'The Contemporary Debate on the Harmony between Islam and Science: Emergence and Challenges of a New Generation', *Social Epistemology: A Journal of Knowledge, Culture and Policy*, 2013, P.7.

¹⁶² On this, see Taner Edis, *An Illusion of Harmony: Science and Religion in Islam*, Prometheus Books, 2007. His evaluation of the effects of this obsession with the fable is dismal: "Right now, if all Muslim scientists working in basic science vanished from the face of the earth, the rest of the scientific community would barely notice" (Steve Paulson, 'Does Islam Stand Against Science', *The Chronicle of Higher Education*, June 19 2011).

¹⁶³ Stefano Bigliardi, 'Stenmark's Multidimensional Model and the Contemporary Debate on Islam and Science', *Theology and Science*, Vol. 12, No. 1, 8–29, 2014, p.19.

The ‘new generation’ of scientist scholars

Recent trends demonstrate how a number of scholars are revisiting the discussion in an attempt to search for a less confrontational stand. Their sense of urgency is powered by the fear that, with sixty percent of the world’s 1.6 billion Muslims now under the age of 30, and without a resolution of the relationship, there could be devastating consequences for the future of science if certain fields of study come to be seen by this generation as antireligious.

The ‘new generation’ (an as yet to be stabilised definition) of Muslim scientists are natural scientists who are, or have been, engaged in scientific teaching and research at university level, who recognise that the scientific method cannot be changed and who deem the *i’jāz* ‘ilmī and *tafsīr* ‘ilmī initiatives unscientific and un-pursuable, not least because they were principally formulated by general thinkers and not by practicing scientists. They reject the ‘scientific exegesis’ of the Qur’ān and write off the entire ‘Islamisation’ of science endeavour (as practised by Islamic apologists in the *i’jāz* genre) as being at its worst hopelessly naïve and, at its best, as no more than an expression of cultural supremacism. This is because it has entailed the identification and development of specifically *Islamic* epistemological foundations, from which a new or renewed Islamic (or Islam-compatible) science is to emerge. Where the older generation considered Islam to be in harmony with science by virtue of a privileged relationship with it (as the exclusive repository of concepts with which science should be reformed *or* as the only scientifically validated religion) the ‘new generation’ simply accepts Islam can be in harmony with science *qua* religion or at least on a footing of equality with other monotheistic religions. They thus see the contributions coming from other cultures and religions not as inadequate or incomplete, but as equal participants in the dialogue of religion and science.¹⁶⁴

A more constructive approach harmonising religious heritage with science

These new generation scientist scholars represent an altogether more nuanced approach: they are open to science and modest about the value and achievements of tradition. Even as they hold to the ultimate authority of the Qur’ān, they prioritise awareness of the nature and aim of scientific knowledge and maintain that, when reading the Qur’ān, science (if properly understood) should always be given priority. They aspire to an approach that dispenses with attempting to draw subtle lines between proper ‘scientific exegesis’ and pseudoscientific ‘scientific miracles’, but also one that by-passes

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, including 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*.¹⁶⁵

For Nidhal Guessoum, who has emerged as one of the most authoritative and better-informed contributors to the debate on Islam and science, from his ground-breaking work *Islam’s Quantum Question*, the Qur’ān cannot be turned into an encyclopedia of any sort, least of all of science:

One must keep in mind the fact that if the Qur’an is to be taken seriously and respectfully, one must uphold the Rushdian (Averroes’s) principle of no-possible-conflict (between the word of God and the work of God) and his hermeneutical prescription. In practice this principle can be turned into a no-objection or no-opposition approach, whereby one can convince the Muslim public of a given idea (say the theory of biological evolution), not by proving that it can be found in the Qur’an but rather by showing that at least one intelligent reading and interpretation of various passages of the Holy book is fully consistent with that theory.¹⁶⁶

¹⁶⁴ Stefano Bigliardi, ‘On Harmonizing Islam and Science: A Response to Edis and a Self-Criticism’, *Social Epistemology Review and Reply Collective*, 2014 Vol. 3, No. 6, 56-68, p.60.

¹⁶⁵ Stefano Bigliardi, *Op. cit.*, p.65.

¹⁶⁶ Guessoum, *Islam’s Quantum Question*, pp. 174-5. Muḥammad ‘Ābid al-Jābrī in his *Critique de la Raison Arabe* also proposed the revival of Averroist thought in Islamic society, but according to George Tarabishi “this thinker hit on the correct title but missed his

Guessoum recognizes that the Qur'ān makes reference to knowledge and natural phenomena, but he rejects all 'extreme positions' regarding the interpretation of such verses. He rather identifies the Qur'ān's capacity to "always be open to new, multilayered meanings as part of its miraculous character."¹⁶⁷

The problem of conflicting views between scripture and science

The issue is how far the openness can extend when, for instance, the Qur'ān says something which is not corroborated, or appears flatly contradicted, by science. Do these scientist scholars have the means to reinterpret scripture in the light of scientific findings and 'restore harmony'? It is a problem that has pre-occupied the old generation Islamizers of science, as well as the new scholars. By equating the Qur'ān with science, as Ziauddin Sardar explained, there is the risk that science ends up elevated to the realm of the sacred, while the divine revelation, in turn, becomes subjected to the verification of 'western science':

[It opens] the Qur'an to the counter argument of Popper's criteria of refutation: would the Qur'an be proved false and written off ... if a particular scientific fact does not tally with it or if a particular fact mentioned in the Qur'an is refuted by modern science? And what if a particular theory, which is "confirmed" by the Qur'an and is in vogue today is abandoned tomorrow for another theory that presents an opposite picture? Does that mean that the Qur'an is valid today but will not be valid tomorrow?¹⁶⁸

The evolution question

The problem is most often manifest in the question of Darwinian evolutionary theory. Although the Muslim world came late to the contemporary debate on creationism and evolution by natural selection, the concept of an evolution of biological organisms, particularly humans from earlier, 'lower' forms now constitutes a major blockage in contemporary Muslim education. Muslim thinkers did not always consider it so far beyond the pale of discussion. Writing in the 1890s, the Lebanese Shaykh Ḥusayn al-Jisr approached the theme unemotionally, taking the view that as yet the theory of evolution was not so much wrong as insufficiently proven. "After outlining his approach to Qur'anic interpretation, Marwan Elshakry writes,

he also put forward the claim that there were some points that a Muslim could concede, both on national or logical grounds and on purely spiritual ones. ... [he] even went on to say that given the general parameters of scriptural interpretation, there was nothing to prevent a Muslim in future from accepting evolution wholeheartedly, given that certain conditions and terms were met. ... With such conditions, al-Jisr proposed that one would therefore not be prevented from taking the Qur'an's "meaning beyond the apparent one and from applying it to what the decisive evidence indicates regarding evolution."¹⁶⁹

Jordanian molecular biologist Dr Rana Dajani notes an important fact in the subsequent rejection of the debate – the fictitious association of the theory with a western 'attack on Islam':

During the first quarter of the twentieth Darwin's ideas became associated with colonialism, imperialism, the West, atheism, materialism, racism by different thinkers and writers in the Muslim world. Therefore, the Muslim religious scholars gradually took a stand against Darwin and his ideas which the general public adopted.¹⁷⁰

target. In other words, he did not perform the process of criticism which we expected. On the contrary, he confiscated our long-awaited process of criticism" (George Tarabishi, *Op. cit.*).

¹⁶⁷ Stefano Bigliardi, 'Stenmark's Multidimensional Model and the Contemporary Debate on Islam and Science', *Theology and Science*, Vol. 12, No. 1, 8–29, 2014.

¹⁶⁸ Ziauddin Sardar, 'Between Two Masters: Qur'an or Science?' *Inquiry : An Interdisciplinary Journal of Philosophy* 2 (8):37-41 (1985).

¹⁶⁹ Marwan Elshakry, *Reading Darwin in Arabic, 1860-1950*, University of Chicago Press, 2013, p.151.

¹⁷⁰ Raja Dajani, *Evolution and Islam: Is there a contradiction?* U. Hasan and A. Osama (Edd), *Islam & Science, Muslim Responses to Science's Big Questions*, Muslim World Science Initiative, 2016, p. 145.

With no natural scientists at the time available in the Muslim world who were also religious Muslims, she explains, the debate between science and faith was imported into the Middle East via the intermediaries of Christian creationists. Unlike in the United States where the epicentre of creationist thought is strong, but statistically insignificant, in education, in the Middle East the equation is reversed: creationism is equally prevalent among the élite as among the less educated public, although actual contributions to the debate are weak and derivative.¹⁷¹ “Debates have multiplied,” Nidhal Guessoum observes,

but scholarly writings on Islam and evolution are still rather rare, and most of them, especially in the “native” languages of Muslims (Arabic, Bahasa Indonesia, Farsi, Turkish) betray either an utter lack of understanding of the scientific aspects of the question, by the traditionalists in particular, or a superficial view of Islamic dogmas and theology by some modernists and secularists. Very few well-informed, insightful, and coherent articles can be found on the subject in those languages, and fewer books still.¹⁷²

Guessoum goes on to characterise the poverty of the debate, as (a) a literalistic reading of the Qur’anic verses relating the story of Adam’s creation; (b) a widespread ignorance, or at least misunderstanding, of evolution by educated Muslims “who most often not only are woefully unaware of the strong evidence supporting Evolution, but very frequently do not even distinguish between the facts of evolution and the theory(ies) that try to explain them”.¹⁷³ Under these conditions there is little hope for an emotionally uncharged, rational discussion:

A demagogic, populist tone can be read in most writings on the subject, authors considering it too controversial and touchy for any views to be expressed on it other than what the public has always heard, namely that evolution is an atheistic “theory” that is far from scientifically solid and clearly opposes well-known tenets of the Islamic creed and must thus simply be rejected and ignored.¹⁷⁴

If Muslims are to move on from the outright rejection of evolution by the entire spectrum of the old generation – from Seyyed Hossein Nasr to Maurice Bucaille to Adnan Oktar – can science be permitted to tell them anything about God’s way with the created world which they could not obtain from the Qur’ān? Can that in any way enhance their religious outlook, beliefs and practices?¹⁷⁵

For Dr Dajani, her Islamic faith empowers her to embrace the scientific approach toward biological evolution:

I argue that biological evolution is compatible with Islam and that the notion that evolution contradicts Islam is a myth. In fact, it is a prime example of what happens when we misunderstand religion. Islam calls for freedom to think and explore, and the lack of freedom to think comes from the misunderstanding of religion.

Islam has always been open minded asking us ... to observe, think and come up with hypotheses to explain phenomena. In other words it proposes to Muslims to adopt the scientific method as we call it today in discovering the world around us.¹⁷⁶

¹⁷¹ Guessoum, *Kalam’s Necessary Engagement*, p.13.

¹⁷² Nidhal Guessoum, ‘Islam and Science: The Next Phase of Debates’, *Zygon: Journal of Religion & Science*, Vol. 50, Issue 4, December 2015, p.859.

¹⁷³ Guessoum, *Kalam’s Necessary Engagement*, *ibid.*.

¹⁷⁴ Guessoum, ‘Islam and Science: The Next Phase of Debates’, *ibid.* Guessoum notes, moreover, that while debate in the West on the issue of divine action in the world is readily undertaken by both physicists and theologians, in the Muslim world “there have been very few, if any, proposals” put forward and the subject remains “a very sensitive issue, and one runs the risk of diverting too much from the orthodoxy and thus being labeled a heretic, hence the dearth of writings on the topic.” (see Guessoum, *Kalam’s Necessary Engagement*, pp.14-15).

¹⁷⁵ Damian Howard, ‘Some Reflections on Stefano Bigliardi’s “On Harmonizing Islam and Science”’, *Social Epistemology Review and Reply Collective*, 2014 Vol. 3, No. 10, p.50.

¹⁷⁶ Raja Dajani, *Evolution and Islam*, pp. 148-9.

As one of the new generation of scientist scholars engaged with what an unfettered science can contribute to the understanding of faith,

my explorations, especially in the science of evolution, lead me to appreciate the elegance and simplicity of how species evolved. That, to me, is ultimate proof to a greater power who sets simple rules to create complex systems over time.¹⁷⁷

The importance, for Dr Dajani, is to prioritise in students the understanding of scientific method, over questions of compatibility with scripture, since the former will strengthen the latter:

The important point here is not whether we are able to convince our students to agree or disagree with evolution. What we should strive for is to teach / instruct our students to develop a rational methodology of assessing the natural world around them and to think independently to come up with their own opinions, hypotheses and theories. If we succeed in that endeavour the rest of the controversies between science and religion will be resolved and we will contribute to the creation of a generation of Muslim students who are freethinkers.¹⁷⁸

Mitigating the tension

While the focus is to be weighted towards scientific competence, the new generation varies in their acceptance of the divorce between the two *magisteria* of religious belief and natural science, but gravitates towards the possibility of a different understanding of scientific results, in a way that amounts to metaphorical, theistic or mystical interpretations of them. In this respect they are not content for the burden of adaptation to be exclusively placed upon the believers. While Nidhal Guessoum calls for a 'multilevel', more metaphorical, interpretation of scripture, he also makes some demands on science as well. For the two ends of the tunnel to meet, something like the following will be required:

- (1) Some new theology must be proposed that would be consistent with modern science even if it does not adhere to the sacred beliefs and writings in a literal way;
- (2) A less materialistic cosmology must be produced, one that would allow for some meaning and spirit to be found in the universe and in existence.¹⁷⁹

There is, therefore, an 'evolution' of sorts taking place in the understanding of the relationship between Qur'ānic scripture and science. Taking a comparative approach, once again, yields important results for Islam. According to George Lindbeck,¹⁸⁰ the relationship in Europe has historically divided itself into to three broad trends:

1. *Cognitive-propositionalism* – The traditional approach, whereby religious doctrines are to be held the authority for stipulating how the world is;
2. *The experiential-expressivism model* – where religious doctrines tell us something about the believer's apprehension of reality, their subjective, emotional life and value decisions;
3. *The cultural-linguistic model* – whereby religious doctrine initiates the believer into a world of shared language and practice, providing a communicative framework rather than stipulating the nature of reality.

The prevalent position in the Christian world now varies between the second and third solutions. Science and religion are held to be not talking entirely about the same thing: the one focuses

¹⁷⁷ Raja Dajani, 'A Response to Damian Howard', *Social Epistemology Review and Reply Collective*, 2015, Vol. 4, No. 3, 43-44.

¹⁷⁸ Raja Dajani, *Evolution and Islam*, pp. 148-9.

¹⁷⁹ Nidhal Guessoum, *Islam's Quantum Question*: p.218. Points of dissension with mainstream scientific views include, for instance, certain areas of quantum mechanics which contain aspects that are "inconsistent with religious beliefs" and "need to be reworked". "Others contend that scientific causality is useful only for ordering events chronologically ... it is not true causality since it does not furnish the 'reason' that events occur as they do". (Kamal Abdali, 'Waiting for the miracle?' *The Friday Times*, August 7th 2015).

¹⁸⁰ George A. Lindbeck, *The Nature of Doctrine: Religion and Theology in a Postliberal Age*, Westminster John Knox Press, London 1984.

primarily on the external world, the other on the internal life of the believer, who apportions the issues into their relevant domains. The two realms are not hermetically sealed, however, since there is an important dialogue taking place between the two, with either realm influencing, and being influenced, by the other. In these arenas, the nature of the dialogue and mutual critique

is not about achieving ‘harmony’ once and for all, as in cognitive propositionalism, but a constant dialectic of mutual interrogation. There is no final answer, no ultimate stability.¹⁸¹

The Muslim world, to date, the ‘new generation’ included, is operating in the first *cognitive-propositionalism* model, which requires an adjudication rather than an accommodation. This paradoxically maintains a conflictual relationship between scripture and science:

If the religious pre-supposition is that religion and science cannot conflict then that adjudication is urgent and will either be religiously dogmatic (to the expense of the science) or scientifically dogmatic, usually forcing on the religion the adoption of some kind of strategy of reinterpretation.¹⁸²

Some scholars take a pessimistic view on prospects in the Middle East of a resolution of conflict using this model. “There is a tension in new generation writings between reinterpretation as applied to religious texts and scientific theories”, writes Taner Edis.

They want some of both. Religious engagement with ancient, obscure texts such as the Qur’an inevitably calls for considerable creativity – they are perceived to be extremely meaningful precisely because they are often partly incoherent, almost meaningless.

As for proposed re-interpretations of this relationship – such as Guessoum’s above-mentioned re-drawing of both ends of the equation: the ‘new theology’ in which evolutionary theory, for instance, is held not to be contradicting core Muslim beliefs given that “many scholars from Islam’s golden age to the present adopted a worldview that accepted evolution as a given”,¹⁸³ or ‘a less materialistic cosmology’ whereby alternative readings of quantum mechanics or biological evolution are proposed that allow for divine design –

such interpretations have no evidence in favor of them, or evade reality-testing altogether. Furthermore, seeking religious interpretations of science goes against an ethos of scientific communication that attempts to reduce ambiguity and the scope for alternative understandings. ... Harmonizing science and religion often conflates creative meaning-making with explanation.¹⁸⁴

Dr Rana Dajani is emblematic of the approach that goes beyond the *cognitive-propositionalism* impasse, and instead embraces ‘the constant dialectic of mutual interrogation’:

To me it is an ongoing dialogue between religion and science. Where one (religion) seeks to guide how to live our lives and the other (science) deals with discovering how the world works. Both will cross over each other. For example as science seeks to understand the higher functions of the brain and what conscience means. One ultimately enters into the realm of religion. Therefore, my approach to both religion and science is an ongoing journey of discovery – the relationship is fluid. It flows like a stream ... This is the path I propose Muslim scientists should adopt.¹⁸⁵

¹⁸¹ Damian Howard, *Op. cit.*, pp.51-52.

¹⁸² Damian Howard, *ibid.*

¹⁸³ This argument is put forward in Guessoum’s work *Islam’s Quantum Question*.

¹⁸⁴ Taner Edis, ‘On Harmonizing Religion and Science: A Reply to Bigliardi’, *Social Epistemology Review and Reply Collective*, 2014, Vol. 3, No. 2, p.41.

¹⁸⁵ Raja Dajani, *Evolution and Islam: Is there a contradiction?* p. 149.

The way forward

Given the disparities between the ways in which Europe and the Middle East has handled the faith-science debate, science has now effectively become a field of inter-religious dialogue. As a universal endeavour, an accumulation of currents of thought and experience from across the globe with universal application and validity, and a universal mathematical language of nature, the case for an identitarian conception of science has long been abandoned by all except the most quarantined.

The historical record makes the case. Scholars in the Islamic world in the past proved themselves capable of significantly advancing scientific knowledge and making important intellectual contributions in various fields and areas so long as the operative environment remained open for thinkers to fully digest the sciences and the philosophical heritage of humanity, and to explore new ideas and avenues without fear. “Today, more than ever,” argues Guessoum,

the Muslim society needs to recover that spirit. It must recognise the multi-dimensional importance of science, readopt that open interactive attitude and intelligently mix modern ideas with its own principles. That is the mission Muslim scientists and intellectuals ... must pursue.¹⁸⁶

The value of a comparative cultures approach to education is thus signally vindicated here, given the similarity of the challenges the route to knowledge has posed to culture and to faith. Fortunately, educationalists in the Muslim world have the advantage of drawing from the hard-won achievements of Europe in this arena where the dialogue and engagement of religion with science has become a serious field of academic exploration and discourse, complete with research centres at the tertiary level, chairs of professorships and specialist journals in circulation addressing the relationship.

A syllabus of comparative culture and civilisation therefore will not merely contribute to the resolution of a conflict in the contemporary Muslim world. By illustrating the commonality of this debate to the western and Islamic worlds, by highlighting and extracting the approaches to scientific endeavour that Muslim scholars adopted during the period of the High Islamic Civilisation, any claims made for an educational particularism to separate the Muslim from the non-Muslim worlds will be exposed as illegitimate. Instead a modern harmonised relation between Islam and science will obtain the required cultural authenticity for it to be indigenised within the broader community, while the very participation of Muslim scholars in the investigation will act as one of the most effective dismantlers of the quarantine.

¹⁸⁶ Nidhal Guessoum, *Islam's Quantum Question*. Guessoum has highlighted the deficit in this respect: “Islam, through its contemporary scholars, has made only small steps in this regard ... particularly among the educated segments of the Muslim society, where conflicts between the modern and the traditional have often led to schizophrenic attitudes.” (Nidhal Guessoum, *Kalam's Necessary Engagement*, pp.17-18).

Works cited

- Abdali, Kamal. 'Waiting for the miracle?' *The Friday Times*, August 7th 2015.
- Amin, H. A. دليل المسلم الحزين إلى مقتضى السلوك في القرن العشرين ('*A Guide for the Sad Muslim to the Behaviour Required in the 20th Century*'), Reprint. Kotobarabia, 1983.
- Attas, Muhammad Naquib al-. *Islām and Secularism*, International Institute of Islamic Thought and Civilization, Kuala Lumpur 1993.
- Axtell, James. *Wisdom's Workshop, The Rise of the Modern University*, Princeton University Press, 2016.
- Bala, Arun. *Dialogue of Civilizations in the Birth of Modern Science*. Palgrave Macmillan 2006.
- Bamford Parkes, Henry. *Gods and Men, The Origins of Western Culture*, Routledge and Kegan Paul, London, 1960.
- Bencheikh, Soheib, interview by Stéphanie Plasse. *La propagande de Daesh et le fantasme de la venue du Mahdi, « sauveur des musulmans »* Jeune Afrique, (5 March 2015).
- Bernal, J.D. *Science in History, Vol.1: The Emergence of Science*. London: Penguin, 1969.
- . *Science in History, Vol.2: The Scientific and Industrial Revolutions*. London: Penguin, 1969.
- Bigliardi, Stefano. *Islam and the Quest for Modern Science: Conversations with Adnan Oktar, Mehdi Golshani, Mohammed Basil Altaie, Zaghoul El Naggar, Bruno Guiderdoni and Nidhal Guessoum*. Istanbul: Swedish Research Institute in Istanbul, Transactions Vol.21, 2014.
- . 'On Harmonizing Islam and Science: A Response to Edis and a Self-Criticism', *Social Epistemology Review and Reply Collective*, 2014 Vol. 3, No. 6, 56-68.
- . 'Stenmark's Multidimensional Model and the Contemporary Debate on Islam and Science', *Theology and Science*, Vol. 12, No. 1, 8–29, 2014.
- . 'The Contemporary Debate on the Harmony between Islam and Science: Emergence and Challenges of a New Generation', *Social Epistemology: A Journal of Knowledge, Culture and Policy*, 2013.
- Brague, Rémi. *Eccentric Culture: A Theory of Western Civilization*. St. Augustine's Press, 2002.
- Buleihi, Ibrahim al-. *Al-Idā'āt programme*. December 2012. <https://www.youtube.com/watch?v=t5QfjBQpS1A>
- . *World Government Summit*. (12 February 2017). <https://www.youtube.com/watch?v=uuIoGXCDz7c>
- Constantelos, Demetrios J. *Christian Hellenism. Essays and Studies in Continuity and Change*. New Rochelle, New York & Athens: Aristide D. Caratzas.
- Dajani, Raja. 'A Response to Damian Howard', *Social Epistemology Review and Reply Collective*, 2015, Vol. 4, No. 3, 43-44
- . *Evolution and Islam: Is there a contradiction?* in U. Hasan and A. Osama (Edd), *Islam & Science, Muslim Responses to Science's Big Questions*, Muslim World Science Initiative, 2016, pp. 142-150.
- D'Ancona, Cristina. "Greek into Arabic, Neoplatonism in translation." In *The Cambridge Companion to Arabic Philosophy*, by P. Adamson and R. Taylor (edd.). 2005: Cambridge University Press.
- Dieterici, F. *Alfārābī's Abhandlung der Musterstaat* كتاب مبادئ آراء أهل المدينة الفاضلة ('*The Book of the Principles of the Views of the Inhabitants of the Ideal City*'). Leiden, 1895.
- Drake, Stillman (tr.) *Discoveries and Opinions of Galileo*, Doubleday, New York 1957.
- Edis, Taner. *An Illusion of Harmony: Science and Religion in Islam*, Prometheus Books, 2007.
- . 'On Harmonizing Religion and Science: A Reply to Bigliardi', *Social Epistemology Review and Reply Collective*, 2014, Vol. 3, No. 2, 40-42.
- Elshakry, Marwa. *Reading Darwin in Arabic, 1860-1950*, University of Chicago Press, 2013.
- Farouq, Wael. *Hats and Turbans, Adaptation to Modernity and Conventional Mind*. New York, 2012.
- Faruqi, Ismail Raji al-. *Al Tawhid: Its Implications for Thought and Life*, 3rd ed. IIIT, 1995.
- Fortin, Ernest L. *Classical Christianity and the Political Order, Reflections on the Theologico-Political Problem, Collected Essays, Volume 2, Ed.J. B. Benestad*. New York, London: Rowman & Littlefield Publishers Inc., 1996.
- Foudah, Sa'īd. تدعيم المنطق Dār al-Rāzī.
- Gastfriend, Eric. "90% of All the Scientists That Ever Lived Are Alive Today." *Future of Life Institute*.
- Ghazālī, Abū Hāmid al-. تهافت الفلاسفة للإمام الغزالي ('*Incoherence of the Philosophers*'), ed. Sulaymān Dunyā, Cairo.

- Golshani, Mehdi. 'Comments on 'A Religiously Partisan Science? Islamic and Christian Perspectives,' *Theology and Science* 3:1 (2005), 88-91.
- Grant, Edward. *God and Reason in the Middle Ages*. Cambridge University Press, 2004.
- . *Science and Religion, 400 B.C. to A.D. 1550: From Aristotle to Copernicus*. Johns Hopkins University Press, 2006.
- . *The Nature of Natural Philosophy in the Late Middle Ages*. Washington: The Catholic University of America Press, 2010.
- Grayling, A.C. *The Age of Genius, The Seventeenth Century and the Birth of the Modern Mind*. London & New York: Bloomsbury Publishing, 2016.
- Guessoum, Nidhal. 'Islam and Science: The Next Phase of Debates', *Zygon: Journal of Religion & Science*, Vol. 50, Issue 4, December 2015, 854–876.
- . *Islam's Quantum Question: Reconciling Muslim Tradition and Modern Science*. I.B. Tauris, London 2011.
- . *Kalam's Necessary Engagement with Modern Science*, Kalam Research & Media, Dubai 2011.
- Hammadi, Riyadh. "The Nahda equation: between the past and the present." *Almuslih.org*.
- Hanafī, Hasan. "A manifesto for reform." *Almuslih.org*.
- Hannam, J. *God's Philosophers, How the Medieval World laid the Foundations of Modern Science*. London: Icon Books, 2009.
- Hasan, U and Osama, A (Edd). *Islam & Science, Muslim Responses to Science's Big Questions*, Muslim World Science Initiative, Islamabad 2016.
- Hoodbhoy, Pervez. *Islam and Science, Religious Orthodoxy and the Battle for Rationality*, Zed Books, 1991.
- Hourani, G. *On the Harmony of Religion and Philosophy: A translation with introduction and notes, of Ibn Rushd's Kitāb faṣl al-maqāl, with its appendix (Dāmima) and an extract from Kitāb al-kashf 'an manāhij al-adilla*. London: Luzac, 1976.
- Howard, Damian. 'Some Reflections on Stefano Bigliardi's "On Harmonizing Islam and Science"', *Social Epistemology Review and Reply Collective*, 2014 Vol. 3, No. 10, 50-52.
- Huff, Toby. *The Rise of Early Modern Science: Islam, China, and the West*. Cambridge University Press, 1993.
- Ibn al-Ṣalāḥ, إِبْنُ الصَّلَاحِ فِي التَّفْسِيرِ وَالْحَدِيثِ وَالْأُصُولِ وَالْفَقْهِ، ed. A. Qal'ajī, Cairo 1403/1983.
- Ibn Rushd, كتاب فصل المقال وتقرير ما بين الشريعة والحكمة من الاتصال ('*Decisive Treatise Confirming the Connection of Sharī'a and Philosophy*'), Ed. A. Nadir, 2nd Ed. Dār al-Mashriq, Beirut 1968.
- Jābrī, Muḥammad 'Ābid al-. دراسة تحليلية نقدية: الخطاب العربي المعاصر. Beirut: Markaz Dirāsāt al-Wahda al-'Arabiyya, 1992.
- Khaldūn, Ibn. *The Muqaddimah, An Introduction to History*. Edited by N Dawood. Translated by F Rosenthal. London: Routledge and Kegan Paul, 1967.
- Kindī, al-, رسائل الكندي الفلسفية ('*Al-Kindī's Philosophical Letters*') Ed. Muḥammad Abū Rīda, Dār al-Fikr al-'Arabī, Cairo 1950.
- Kogan, Barry. *Averroes and the Metaphysics of Causation*, University of New York Press, 1985.
- Krawietz, B, and G. Tamer. *Islamic theology, philosophy and law, debating Ibn Taymiyya and Ibn Qayyim al-Jawziyya*. Berlin and Boston: De Gruyter, 2013.
- Lakhdar, Lafif. 'Is the Qur'ān an encyclopædia of science?' *Almuslih.org*.
- . "Moving from Salafī to Rationalist Education." *Conference on Modernity and Arab Modernity*. Beirut, 2004.
- . الميثاق العقلاني ('*The Charter of Rationality*') *elaph.com*, November 19th 2007.
- . "The Reform of Islam is both Necessary and Possible." *Almuslih.org*.
- Lindbeck, George. *The Nature of Doctrine: Religion and Theology in a Postliberal Age*, Westminster John Knox Press, London 1984.
- Lindberg, David. *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, prehistory to A.D. 1450*. University of Chicago Press, 2007.
- Livingston, John W. 'Western Science and Educational Reform in the Thought of Shaykh Rifaa al-Tahtawi', *International Journal of Middle East Studies*, Vol. 28, No. 4, November 1996, pp.543-564.
- Lloyd, Geoffrey. *The Revolutions of Wisdom: Studies in the Claims and Practice of Ancient Greek Science*, Berkeley, University of California Press, 1989.

- Maas, P, and C. Trypanis. *Sancti Romani Melodi Cantica - Cantica Genuina*. Oxford University Press, 1963.
- Makdisi, George. "Madrasa and University in the Middle Ages." *Studia Islamica*, No. 32 (1970).
- Marmura, M. 'Ghazali and Ash'arism Revisited', *Arabic Sciences and Philosophy*, Cambridge University Press, Vol. 12, Issue 1, March 2002, 91-110.
- Migne, A. *Εἰς τὸν Μεγάλῳ βασιλεῖον Ἐπισκοπὸν Καίσαρειας Καππαδοκίας Ἐπιταφίος* (*Funebris oratio in laudem Basilii Magni Caesareae*), Migne, *Patrologia Graeca*, Vol. 35.
- Moss, J.D. 'Galileo's Letter to Christina: Some Rhetorical Considerations', *Renaissance Quarterly*, Vol. 36, No. 4 (Winter, 1983), 547-576.
- Nabahānī, Taqī al-Dīn al-. الشخصية الإسلامية (*The Islamic Personality*) Part One, Hizb al-Tahrir Publications (Beirut, Dar al-Umma, , 6th ed. 2003).
- Ofek, H. "Why the Arabic World Turned Away from Science." *The New Atlantis, A Journal of Technology and Society*, Winter 2011.
- Qimny, Sayyid al-. *ADHOC convention: "The Roots and Causes of Islamic Violence"*. Brussels, May 22 2016.
- Ragab, Ahmed. *Islam and Science* in J. Haag, G, Peterson and M. Spezio (edd), *The Routledge Companion to Religion and Science*, Chapter 5, Routledge, Abingdon and New York, 2012, pp.45-57.
- Reilly, Robert. *The Closing of the Muslim Mind, How Intellectual Suicide Created the Modern Islamist Crisis*, ISIS Books, Wilmington, Delaware, 2010.
- Russell, Bertrand. *The History of Western Philosophy*. New York: Simon and Schuster, 1945.
- Sā'if, 'Abd al-Latīf. "ملاحظات حول الحداثة في الخطاب العربي المعاصر." *Al-Mustaqbal al-'Arabī*, n.146, 1991.
- Sabra, A.I. 'The Appropriation and Subsequent Naturalization of Greek Science in Mediaeval Islam: a Preliminary Statement', *History of Science* XXV (1987), pp.223-43. Reprinted in F. Ragep and S. Ragep (edd), *Tradition, Transmission Transformation, Proceedings of Two Conferences on Pre-modern Science held at the University of Oklahoma*. E.J. Brill, 1996.
- Saleh, Hashem. 'Mohammed Arkoun on the Golden Age and Beyond', *Almuslih.org*.
- Sanduk, Mohammed al-. "Freedom and the Progress of Civilisation." *Almuslih.org*.
- . "Intellectual distortion and societal suicide." *Almuslih.org*.
- . "Intellectual self-isolation and the prospects of constructing a culture." *Almuslih.org*.
- . "The Influence of Freedom on Growth of Science in Arabic-Islamic and Western Civilizations." *PhilSci Archive*, 2009.
- Sardar, Ziauddin. 'Between Two Masters: Qur'an or Science?' *Inquiry: An Interdisciplinary Journal of Philosophy* 2 (8):37-41 (1985).
- Shabbār, D. S. "إلحياء" قراءة في جدل المحلي والكوني أو ظاهرة التناقض، الثقافة والعولمة، July 2007.
- Shoqiran, F. S. "Saudi intellectual: Arabs block civilization." *Al Arabiya*, November 2016.
- Stark, Rodney. *For the Glory of God How Monotheism led to Reformations, Science, Witch-hunts, and the End of Slavery*. Princeton and Oxford: Princeton University Press, 2003.
- Tarabishi, George. أين نحن في العالم؟ متى ينتهي الانحدار؟ ('Where are we in the world? When will the regression end?') (Interview with *Al-Hayāh* newspaper - January 30th 2006)
- Tarabishi, A. "Why Have Muslim Scholars Been Undervalued Throughout Western History?" Islamic Research Foundation International, Inc. www.irfi.org.
- Ulph, S, and Sookhdeo, P. *Reforming Islam, Progressive Voices from the Arab Muslim World*. Almuslih Publications, 2014.
- Watt, W. Montgomery. *Imām al-Ghazālī's Deliverance from Error and The Beginning of Guidance*. Kuala Lumpur: Islamic Book Trusts, Revised Edition, 2005.

Arabic texts

ⁱ فالهويات الثقافية للشعوب هي أمنع الحصون والقلاع على الاختراق والذوبان الكلي، وإن كان التأثير عليها وتشويه وطمس بعض عناصرها أمراً وارداً ... الثقافة التي تتوحد عند أصولها المرجعية وتنتفتح في تجلياتها لتستوعب كافة أشكال ومظاهر الحياة، ولتحوار الآخر وتتفاعل معه، هي التي بإمكانها أن تعيش وتؤثر وتساهم في التقويم المحلي والكوني ... وبقدر ما تملك ثقافة ما قدرة ذاتية على الانفتاح والحوار بقدر ما تساهم في عملية التثاقف الإيجابي مع الثقافات الأخرى.

ⁱⁱ وينبغي لنا أن لا نستحي من استحسان الحق واقتناء الحق من أين أتى، وإن أتى من الأجناس القاصية والأمم المبينة لنا. فانه لا شيء أولى بطالب الحق من الحق، وليس ينبغي بخس الحق، لا تصغير بقائله ولا بالآتي به؛ ولا أحد بخس بالحق، بل كل بشرفه الحق.

ⁱⁱⁱ <https://www.youtube.com/watch?v=t5QfjBQpS1A> 19:04ff.

^{iv} تشوفوا إلى علوم الأمم فنقلوها بالترجمة إلى علومهم وأفرغوها في قالب أنظارهم، وجردوها من تلك اللغات الأعجمية إلى لسانهم، وأربوا فيها على مداركهم، وبقيت تلك الدفاتر التي بلغتهم الأعجمية نسيا منسيا وطللاً مهجوراً وهباء منثوراً. وأصبحت العلوم كلها بلغة العرب، ودواوينها المسطرة بخطهم، واحتاج القائلون بالعلوم إلى معرفة الدلالة اللفظية والخطية في لسانهم دون ما سواه من اللسان، لدروسها وذهاب العناية بها. [ابن خلدون، المقدمة، الفصل الرابع والأربعون - في أن العجمة إذا سبقت إلى اللسان قصرت بصاحبها في تحصيل العلوم عن أهل اللسان العربي].

^v أن تعلم رطانة الأعاجم لا تقف عند تعلم اللغة والحرف، وإنما يتعدى ذلك للإعجاب والتشبه وقراءة ثقافتهم المخالفة لهدى النبي صلى الله عليه وسلم، وكل هذا وغيره له من الآثار السلبية ما لا يخفى.

^{vi} اكتشفت هنا في الغرب، أن هذا الغرب لم يبين نفسه إلا بقدر ما نقد نفسه. العقل الغربي صار متقوقاً وعالمي الحضارة حين مارس النقد الذاتي. أما نحن الذين لدينا موروث لا يقل أهمية أو حجماً عن الموروث الغربي، فإننا لن نستطيع أن نباشر مهمة التحديث والوصول إلى النهضة المرجوة ما لم نقم بالعملية النقدية نفسها التي اخضع الغرب نفسه لها. لن نستطيع أن نخوض معركة الحداثة ونحن عراة من النقد الحقيقي

^{vii} <https://www.youtube.com/watch?v=uuloGXCDz7c> , 13:16ff.

^{viii} 7:00-7:28. <https://www.youtube.com/watch?v=t5QfjBQpS1A>

^{ix} لم يحدث قط أن مرت أمة إلى مرحلة الإبداع العلمي والتكنولوجي والفكري دون المرور بمرحلة تقليد العلم والتكنولوجيا الغربيين. الصين لم تحقق اليوم من التقدم الاقتصادي في عشرين ما حققته بريطانيا في قرنين إلا بفضل تقليد الغرب. وكذلك فعلت الهند و"النمور" الآسيوية. تماماً كما أن الطفل يتعلم بتقليد أبويه ومعلميه قبل أن ينتقل إلى مرحلة الاستقلال عنهما وربما التفوق عليهما

^x وكما أن الترجمة الجيدة هي فعل مشاركة في أبداع المؤلف، وبالمثل التقليد الحق للفكر والعلم الغربيين هو في الواقع مشاركة فعالة في الاكتشاف العلمي والتكنولوجي والاستيمولوجي والثقافي... تحريم تقليد الغرب هو عنصرية ضد الذات، هو انتحار!

^{xi} <https://www.youtube.com/watch?v=uuloGXCDz7c> , 5:27ff.

^{xii} <https://www.youtube.com/watch?v=uuloGXCDz7c> , 5:27ff.

^{xiii} <https://www.youtube.com/watch?v=uuloGXCDz7c> , 25:36ff.

^{xiv} تعددية العقول بتعددية الثقافات، كما يزعم الجابري، تترتب عليها نتائج إبستمولوجية كارثية: نفي وجود - أو إمكانية وجود- قوانين علمية كونية، ومعارف كونية. وهذا ما أدركه ابن رشد الذي كتب في "تلخيص ما بعد الطبيعة": "أما العقل، فإن من شأنه أن ينتزع الصور من الهيولي [=المادة] ويتصورها مفردة على كنهها، وذلك من أمره بين؛ وبذلك صح أن يعقل ماهيات الأشياء؛ وإلا لم تكن ها هنا معارف أصلاً."

^{xv} ففي المملكة المغربية والصين يدرس الطالب الرياضيات نفسها والطب نفسه... إلخ. الفقهاء المسلمون تبنوا، في المعاملات، القانون الروماني، الذي تحول إلى عرف وعادة، في مصر وبلاد الشام وشمال أفريقيا؛ بالمثل ترجم المتكلمون المسلمون "الوغوس" اليونانية بـ"علم الكلام" واقتبسوا المعجم المصطلحي لمنطق أرسطو؛ كذلك فعل الفلاسفة العرب والمسلمون الذين عرّبوا كثيراً من المصطلحات الفلسفية اليونانية ولم يترجموها. ولم يتعللوا، كما فعل الجابري، بخصوصيتهم الثقافية الإسلامية لبحرهم أنفسهم من تبني ما أنتجه العقل الكوني في روما وأثينا.

^{xvi} <https://www.youtube.com/watch?v=WPnL5xPEPac> 2:10:37 – 2:12:20.

^{xvii} فهذه المسائل... لا تلائم الإسلام بوجه، ومعتقداتها معتقد كذب الأنبياء، انهم ذكروا ما ذكروه على سبيل المصلحة، تمثيلاً لجماهير الخلق وتفهيماً. وهذا هو الكفر الصراح الذي لم يعتقده أحد من فرق المسلمين... ومذهبهم في تلازم الأسباب الطبيعية هو الذي صرح المعتزلة به في التولد... فمن يرى تكفير أهل البدع من فرق الإسلام، يكفرهم أيضاً به. ومن يتوقف عن التكفير، يقتصر على تكفيرهم بهذه المسائل.

^{xviii} فإن الغرض من هذا القول أن نفحص، على جهة النظر الشرعي، هل النظر في الفلسفة وعلوم المنطق مباح بالشرع، أم محظور، أم مأمور به، إما على جهة الندب، وإما على جهة الجوب.

^{xix} **الآفة الثانية:** نشأت من صديق للإسلام جاهل، ظن أن الدين ينبغي أن ينصر بإنكار كل علم منسوب إليهم: فأنكر جميع علومهم وادعى جهلهم فيها، حتى أنكر قولهم في الكسوف والخسوف، وزعم أن ما قالوه على خلاف الشرع. فلما قرع ذلك سمع من عرف ذلك بالبرهان القاطع، لم يشك في برهانه، ولكن اعتقد أن الإسلام مبني على الجهل وإنكار البرهان القاطع، فيزداد للفلسفة حباً وللإسلام بغضاً.

^{xx} وليس في الشرع تعرض لهذه العلوم بالنفي والإثبات، ولا في هذه العلوم تعرض للأمور الدينية

^{xxi} فهذه آفة عظيمة لأجلها يجب زجر كل من يخوض في تلك العلوم، فأنها وإن لم تتعلق بأمر الدين، ولكن لما كانت من مبادئ علومهم، سرى إليه شرهم وشؤمهم، فقل من يخوض فيها إلا وينخلع من الدين وينحل عن رسه لجام التقوى.

^{xxii} الحاذق في صناعة واحدة ليس يلزم أن يكون حاذقاً في كل صناعة ، فلا يلزم أن يكون الحاذق في الفقه والكلام حاذقاً في الطب، ولا أن يكون الجاهل بالعقليات جاهلاً بالنحو، بل لكل صناعة أهل بلغوا فيها [رتبة] البراعة والسيق. وإن كان الحمق والجهل (قد يلزمهم في غيرها. فكلام الأوائل في الرياضيات برهاني، وفي الإلهيات تخميني؛ لا يعرف ذلك إلا من جزّيه وخاض فيه

^{xxiii} كذلك بلغنا لهذا العهد ان هذه العلوم الفلسفية في ببلاد الإفرنجية من ارض رومة وما إليها من العدو الشمالية نافقة الاسواق وان رسومها هناك متجددة ومجالس تعليمها متعددة ودواوينها جامعة متوفرة وطلبتها متكثرة والله أعلم بما هنالك

^{xxiv} <https://www.youtube.com/watch?v=uuloGXCDz7c> , 4:49.