Islam’s Pyrite Age

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It is important to dispel misconceptions about a “Golden Age” propounded in ANY sacred history. This must be done with the understanding that upsetting a sacred apple cart will not sit well with those who’s existential ballast rests on those apple carts.

Romanticizing the so-called “Golden Age” of Islam has become somewhat of a cottage industry for Islamic apologists. Much of this involves the bromide that the Muslim world preserved the wisdom of the ancient world–and that we should be thankful for the gesture. Indeed, we ARE thankful for the gesture…which was tragically necessary due to the virulently anti-intellectual policies of the Roman Catholic Church throughout Europe for so long.

The preservation of ancient materials was a laudable enterprise so far as it goes. The “catch” is that it only goes so far. After all, curation is not creation.

As we’ll see, for every work preserved, there was an untold number destroyed; and, typically, destroyed for explicitly religious reasons (see my two-part series: “The History Of Salafism”). So the refurbishing of extant material within Dar al-Islam was not as estimable an endeavor as it might seem at first blush.

The fact is: A handful of scribes outside of Christendom (read: beyond the reach of the Vatican’s intellect-stifling dominion) managed to preserve selected Greco-Roman, Persian, and Indian works from Ancient Antiquity. Much of that occurred in the Muslim world. Be that as it may, we mustn’t pretend that keeping records of others’ accomplishments was itself a towering accomplishment. In medieval Dar al-Islam, the project was more a salutary service–for posterity–than it was emblematic of widespread intellectual flourishing.

There are, of course, some notable examples of such headway–which I will explore forthwith. For now, it suffices to say that there emerged some preliminary astronomy, some rudimentary optics, some crude medical treatments, and some elementary algebra / trigonometry. In terms of inventions during this era, the Chinese invented far more than anyone else in the world–most notably: anesthesia, gun-powder, paper, reusable print, and movable type.

The fact that there were sporadic felicitous occurrences in Dar al-Islam (primarily: scriveners tasked with preserving documents from the Axial-Age) attested to the virtue of the occasional stalwart, not to the (imagined) virtues of the ambient religiosity. In terms of inventions from the Muslim world that WERE used, much of it was improvement on pre-existing inventions–as with the astrolabe (a matter that will be discussed forthwith).

Today, those smitten with romanticized Islamic historiography are glibly ignorant of the actual history. In order to cultivate an accurate understanding of Islam’s “Golden Age”, it is necessary to disabuse ourselves of popular myths about its oft-touted achievements. My thesis here is as follows: ***What is often dubbed Islam’s “Golden Age” would more accurately be called its “Pyrite Age”.*** In support of this proposition, we might begin with an inquiry into the fabled “House of Wisdom” in Baghdad: “Bayt al-Hikma”.

The use of “house” to name a special place goes back to the 3rd millennium B.C., when the Sumerians (and

early Assyrians) dubbed their temples, "E-***x***" [House of ***x***; where ***x*** was the name of the deity]. Thus the sanctuary of Enlil / Ishtar was dubbed "E-nam-tila" [House of Life]. In the 2nd millennium B.C., the court scribes of Ancient Egypt worked out of the "Per Ankh" [House of Life]. Thus "Per ***x***" denoted "House of ***x*** ". Thus the primary temple to Ra-Atum in the Egyptian city of Aw[a]nu (Ptolemic: "Helio-polis"; City of the Sun) was "Per Aat" [Great House] or "Per Atum" [House of Atum]. And in ancient Greek tradition, a temple was sometimes referred to as an "oikos" [house].

Such nomenclature could indicate the architecture of the celestial realm as well. In Persian mythology (i.e. Zoroastrianism), the hereafter was divided into two places: one for the saved (the House of Song) and one for the damned (the House of Lies). In Norse mythology, each of the nine other-worldly realms are referred to as "***x***-heim[r]" [House of ***x***]. In ancient Chinese astrology, each star system is dubbed a "Xiu" [mansion]. In ancient Indian astrology, each star system is dubbed a "Nakshatra" [lunar mansion], as attested in the "Vedanga-Jyotisha" from the late 2nd millennium B.C.

Unsurprisingly, the oldest Semitic languages (Eblaite and Ugaritic) likely derived their terms for "palace" from the Sumarian "E-gal" [Big House]; itself a variation on "E-Lugal" [House of the King]. This explains the ancient Semitic term was "heikhal"…which was later rendered "haykal" in Arabic. (Meanwhile, "bayt" comes from "be[i]t", which comes from the early Semitic "bit". Classical / Masoretic Hebrew renders this "bet[h]".) {1}

The abode of the highest Sumerian gods was made of cedar wood. It is no coincidence that, after being merely a tent (tabernacle), the earliest Shasu (proto-Hebrew) temple, "Bet[h]-El" (the LITERAL abode for the Canaanite deity, Yahweh) was ALSO made of cedar wood. For cedar was seen as an exalted material imbued with divine properties.

In Classical Arabic, "Dar" allows for a more metaphorical use of "abode" (even as both "bayt" and "dar" can be translated as "house"). Hence "Dar al-Islam" vis a vis "Dar al-Kufr" are used as ways to divvy up mankind. This is analogous to the broader usage of "oikos" in Greek–as found in the Gospel of Luke: "Go into the highways and hedges, and compel them to come in, that my house may be filled" (14:23). This is, of course, not a literal house. Here, "oikos" is a metaphor for a global religious community. The same goes for Classical Hebrew–as when Isaiah states: "For my house will be called a house of prayer [beit tepilah] for all people" (56:7). Hence the moniker "Beit Yisra-El" [alt. "Beth Israel"], whereby the global Jewish community ("Israel") is referred to as a house. {2}

As already mentioned, Baghdad's medieval "Bayt al-Hikma" [House of Wisdom] was not a place of "higher learning" in the modern sense. Its mission was more akin to information-poaching; as it primarily involved a process of acquisition and collation. The enterprise was rendered more a business (a lucrative operation, in service to the State) than anything resembling a scholarly endeavor. The caliphate paid exorbitant amounts of money to those who could find material to add to its cache of materials.

Thus the incentives for the accumulation of documents were largely financial, not intellectual. In other words, the massive project was primarily motivated by money rather than by some newfound love of (genuine) scholarship. After all, scholars don't merely collect pre-existing knowledge; they seek to QUESTION–then MODIFY and/or ADD TO–whatever knowledge already exists. It is therefore safe to assume that rarely did anything resembling symposia occur in the fabled "Bayt al-Hikma"–as would have been found at the many scholarly institutions listed later in this essay.

The over-riding concern of Baghdad's grand operation, then, was curation, not edification…at least, not outside the bounds of piety (which were strictly demarcated by the Sunnah). Consequently, the venue would be most accurately described as a "Khizanat Kutub al-Hikma" [Warehouse for Books of Wisdom].

{2}

This point is important: Rather than being produced, knowledge was being appropriated–with, perhaps, minor modifications as the need arose. In this sense, the venue-in-question could be more accurately characterized as a dogma-emporium than as a lyceum.

Regarding the curation that DID occur, we might note that the most notable scrivener was not even a Muslim; it was a Nestorian Christian: the Syriac writer, Hunayn ibn Ishaq. In fact, many of the scholars working in Baghdad during this period were dhimmis (non-Muslims). Also note the "Sabian", Thabit ibn Qurra of Harran; and his grandson, Thabit ibn Sinan. These dhimmis were not ghettoized as were, say, Jewish communities in medieval Europe; so such "others" enjoyed more freedom in Baghdad than non-Catholics would have within the orbit of the (theocratic) Holy Roman Empire. In medieval Baghdad, "dhimmi" scholars intermingled with the Muslim scholars: men who recognized–at least, for the time being–the value of knowledge brought from outside Dar al-Islam.

A crucial point: We often pay attention to what ACTUALLY WAS preserved; because that–and only that–is what is now available to us. Yet we often neglect to note what was NOT preserved; and is consequently no longer available in the archeological record. Obviously, what we can now see is only what was retained; not what was eliminated. It is safe to assume that not everything was kept during this curation project. Invariably, an untold amount was destroyed.

As is plain to see, the ONLY material that was kept was that which did not overtly trespass upon the Sunnah, and thus threaten established dogmas. What we find, then, is material that had utility for the empire: medicine, geography, mathematics, etc. For it was soon discovered that the Koran was worse than useless when it came to such matters. Considering this, running a information-harvesting operation WITHIN THOSE BOUNDS was an eminently pragmatic thing to do.

And so it went: The desperation to find solutions to pressing problems that could only be found outside of their own (embarrassingly limited) scriptures lead the Muslim scribes of "Bayt al-Hikma" to focus on whatever was available at the time…no matter how spurious it turned out to be. Hence the emphasis on the errant disquisitions of, say, Claudius Galenus (of the four humors fame) and Claudius Ptolemy (of geo-centricity fame). {4} Meanwhile, an obsession with alchemy drove an effort to decipher a potpourri of Coptic mystical texts. (As it happens, "alchemy" is an Arabic word.)

When Islamic expositors attempted to add their own insights, they were oftentimes comically wrong–as when the cure for epilepsy (a condition with which the Seal of the Prophets himself may well have been afflicted) was said to be the exorcism of "djinn" [evil demons]. {5}

Lord only knows the number of invaluable documents that were inspected then discarded. It is safe to assume that anything that dealt with unsanctioned inquiries (anything that may have undermined the sacrosanctity of Islamic doctrine) was eliminated from the curriculum.

Hence a worthwhile query NOT is not merely concerned with what can be found in the collected materials in Baghdad, Damascus, Samarkand, etc., but what sorts of things CANNOT be found. Conspicuously absent in the Bayt al-Himka's collection is the work of such icons of Classical Antiquity as Autolycus of Pitane, Pyrrho of Elis, Zeno of Elea, Zeno of Citium, Zeno of Sidon, Diogenes of Sinope, and Philodemus of Gadara. From Ancient Athens, we find that the writings of Plato and Aristotle were (largely) kept; but what about Apollodorus…and Arcesilaus…and Philo of Larissa? And what of Athenian philosopher, Epicurus of Samos? His magnum opus, "On Nature" championed "ataraxia": equanimity, dispassionate thinking. That wasn't included either.

And the Pythagorean philosopher, Philolaus of Magna Graecia? Where is he? And what of the great Anatolian (stoic) philosopher, Epictetus of Hierapolis [Phrygia], who's landmark book on ethics, the "Enchiridion", is nowhere to be found in the House of Wisdom's collection of preserved works? Why not? Also conspicuously absent in the collections is the work of such luminaries as Plotinus of Lykopolis, Marcus Tullius Cicero, Marcus Aurelius, and John Philoponus of Alexandria. Seneca "the Younger" of Cordoba was an Andalusian; so why weren't HIS writings included? {6}

We could go on and on. From these Arab records, we can find Euclid of Alexandria (who dealt primarily with mathematics in his "Elements") as well as Hero of Alexandria (who designed very useful devices). But what about the famed Thracian thinker, Democritus (who's focus was political philosophy)? Nope. We can find Archimedes of Syracuse (who also dealt primarily with physics). But what about the great geometer, Eratosthenes of Cyrene (who postulated that the Earth was spherical, and revolved around the sun)? Nope.

The explanation for all this is plain to see: The Abbasid authorities were primarily concerned with appropriating material that seemed to have immediate utility (helping to solve eminently practical problems, thus making life easier; and perhaps even help bolster the power of the Caliphate)…yet did not threaten to upend the incumbent order. For instance, trigonometry and astronomy were especially useful for determining the direction of the qibla; as well as the proper timing for "salat" [daily prayers] and Ramadan.

And so it went: The curation project limited itself to materials that were seen as not blasphemous–most notably: material having to do with medicine, mathematics, optics, and engineering. In other words: technology, not philosophy. Much was done; yet unfettered CRITICAL inquiry had nothing to do with it. Anything that may have brought into question the sanctified dogmatic system was jettisoned.

Another primary utility was sophistry–a rhetorical craft that was extremely useful for proselytization ("dawa"). It comes as no surprise, then, that we find a prevalence of Aristotle's "Rhetoric" and "Topics", which would be tentatively embraced by such Islamic fundamentalists as Al-Ghazali. (I discuss this matter at length in part one of "The History Of Salafism".)

It is clear, then, that "Bayt al-Hikma" was hardly a bona fide university–as was, say, Plato's academy at Athens (Greece)…or the magisterial Maha-vihara at Nalanda (India)…or the Mouseion at Alexandria (Ptolemaic; then Roman Neoplatonist). (I enumerate all such examples below.) Nor did it even come close to resembling the medieval universities at Bologna (Italy) and at Oxford (England), founded–via grass-roots efforts–in the 11th century. These last two served as quasi-secular bastions for critical inquiry in an otherwise theocratic milieu.

The juxtaposition between "Bayt al-Hikma" and said institutions (GENUINE institutions of higher learning) is stark. One might even note that the universities of Bologna and Oxford have survived for the past millennium…while the days of "Bayt al-Hikma" were numbered. {20}

Happily, translation activity went into overdrive under Abbasid caliph Abu Jafar Abdullah al-Mamun [ibn Harun al-Rashid] in the 9th century: a man who–felicitously–was smitten with Hellenic culture. In fact, it was during Al-Mamun's caliphate that the Greek word, "philo-sophie" entered the Arabic vernacular, as "falsafa". Indeed, he actively encouraged Peripatetic (Aristotelian) thinking in Baghdad–a policy that was famously exemplified by Al-Kindi…who would be a primary inspiration for Al-Farabi…who, in turn, influenced the likes of Avicenna.

Al-Mamun's predecessor, the cosmopolitan Abbasid caliph, Harun al-Rashid (r. 786 – 809) had set the stage for Baghdad to become a major cultural center. (Caliph Al-Mansur had recently established Baghdad as the new capital.) Al-Rashid established the novel–and, alas, short-lived–precedent of allowing accomplished Jewish, Christian, and Zoroastrian scholars to be appointed to elevated posts. In other words: Insofar as he took religion OUT of the equation, he was able to initiate the brief period of intellectual flourishing in Baghdad. Headway was made despite ambient religiosity. After all, one cannot move BEYOND a dogmatic system by recourse to the constraints OF that very dogmatic system.

Al-Rashid was a contemporary of Charlemagne, and corresponded with the Frankish Emperor on friendly terms. By the time Al-Mamun sponsored the scribes of Bayt al-Hikma, it was well-established that if Dar al-Islam was to gain knowledge, it would need to undertake a major project of translating works from Greek, Latin, Syriac, Persian, Sanskrit, and Chinese. That is: He recognized that he would need procure a familiarity with the achievements of other cultures. And so it went that Al-Mamun was the primary figure responsible for instituting the knowledge-curation program for which Bayt al-Hikma became renown.

This policy had the added effect of (temporarily) encouraging cosmopolitanism in Baghdad. As mentioned, participants were obliged to grapple with texts not only in Koine Greek, but in Vulgar Latin, Pahlavi, Syriac-based languages (like Sogdian), Prakrit, and Classical Chinese. Initially, the primary language of Bayt al-Hikma would have been Syriac and Pahlavi, as–in its earliest days–Classical Arabic had only recently been developed. It was not until the end of the 9th century that Classical Arabic would have become the primary language into which texts were translated. (See my essay on "The Syriac Origins Of Koranic Text".)

Al-Mamun's forward-thinking policy was followed by his relatively open-minded successors: Al-Mutasim and Al-Wathiq. But here's the crucial point: Al-Mamun, Al-Mutasim, and Al-Wathiq were from the heterodox (quasi-rationalist) "Mutazila" sect of Islam–founded by the 8th-century Hijazi dissident, Wasil ibn Ata of Basra (who taught in Baghdad). Inspired by Hellenic philosophy, the Mutazilites denied the status of the Koran as the uncreated, eternal word of god; and so had no qualms with attempts to reconcile piety with rationalism–and, in some cases, with natural philosophy. Consequently, they actively encouraged the curation–and even advocated the co-optation–of extant knowledge from Dar al-Kufr. This explains the renown of such Mutazili scholars as Al-Masudi (early 9th century).

However, the NEXT caliph, Ja'far ibn Muhammad al-Mutasim Bi'llah (of Samarra), was NOT a Mutazilite; he was a SALAFI. So he was not interested in science / rationalism…or in ANYTHING that was from outside the Sunnah. Hence Kafr material would no longer be tolerated. {45}

Known by the regnal name, "Mu-ta-wakkil ala Allah" [He Who Relies On God Alone], Jafar al-Mutasim took the Koran literally. Consequently, he saw philosophy as heretical; and as a result brought the heyday of "Bayt al-Hikma" to an end. The lesson here is quite clear; but let's spell it out: Islam CAN be accommodating to intellectual activity, but only insofar as it unshackles itself from the diktats of its sacred scriptures; and eschews a revanchist doctrinal approach.

The repercussions of the (Reactionary) Salafi approach were entirely predictable. Being as they were heterodox (stressing "ijtihad" [independent thinking] so prominently), many prominent Mutazilites were routinely executed for heresy. From then on out, this intellectually-stifling precedent continued: for the remainder of Abbasid rule and thereafter.

Couple the stifling of rationalism with the spread of the (vehemently anti-intellectual) Ashari school of thought in the Muslim world–and the demise of Bayt al-Hikma was inevitable. Asharism eschewed natural

philosophy (i.e. science / reasoning) in favor of clerical authority and unconditional deference to the Sunnah. Doctrinal fealty trumped everything. Whatever residue of philosophical thought was allowed to persist was couched in mysticism and religious apologetics (that is: not philosophy). Thus GENUINE "ijithad" was rendered verboten. {17}

As a result, figures like, say, Ibn Sina (a.k.a. "Avicenna") became anathema; while figures like Ibn Rushd (a.k.a. "Averroës") were banished for heresy (and their books burned). In other words, the few remaining flickering lights of arete in the Ummah were snuffed out. {8}

Demise Of A Halcyon Era:

Let's review: The Mutazilites contended that the Koran was created, not eternal. The implication was that god's plan must be surmised through the employment of Reason. They espoused a process whereby our rational faculties were brought to bear on "received wisdom"–making sense of it in light of new insights as they arose. One might say that they though of their holy book as a living document–perpetually subject to new interpretation.

By stark contrast, the Asharites believed the Koran to be co-eternal with the Abrahamic deity, and thus unimpeachable. After all, it was seen as a verbatim transcript of the series of missives delivered via angelic emissary to the Last Prophet, from an omniscient super-being. It was THE FINAL word; and so had to be taken literally. Believing this precluded the need for any and all critical reflection. ("We already have the speech of god at our disposal; so what more could we mere mortals possibly add to it?")

And so, in place of the rationalist Mutazili school, the anti-rationalist Ashari school rose to preeminence–and along with it: the demise of erudition in Dar al-Islam. Philosophical / scientific inquiry was thereafter curtailed–and in many cases, downright forbidden. Soon, the most ardent traditionalists in the Muslim world at the time (the Hanbalis) had made Baghdad their stronghold.

From that juncture on, the deterioration in the caliber of scholarship–not to mention of civility–became quite apparent. In "The Formation of Islam", Jonathan Berkey noted: "It was Hanbali preachers and others who were most active in mobilizing crowds to oppose–vociferously and sometimes violently–the public expression of religious ideas that ran counter to the strict traditionalism which [had become] popular with the Baghdadi populace… [In Baghdad] some Shafi'i scholars and preachers were also active in the traditionalist movement and in stirring up protest against exponents of the rationalist Ash'ari theology [as well as against Shiites]" (p. 218). Impartial historians concur that by the 11th century, the common understanding was that the so-called "bab al-ijtihad" [gates of Reason qua independent thinking] had closed. Genuine "ijtihad" would thereafter be a thing of the past. Thereafter, only "taqlid" (deference to precedent) would be acceptable. {46}

Baghdad was not an isolated case. During the 11th century, the decline of Islam's "Golden Age" seems to have occurred elsewhere as well–most notably: in Islamic Andalusia. {49} In other words, the repercussions of those new (vehemently anti-intellectual) policies were soon felt on the Iberian peninsula, where cosmopolitan centers like Seville, Cordoba, Toledo, and Granada were located. Activity in that region seems to have reached its apotheosis under the ruthless Al-Mansur [ibn Abi Amir] (a.k.a. "Almanzor"), who died in 1002. By 1031, the Caliphate of Cordoba had disintegrated.

It eventually became de rigeuer for Islamic apologists to place the blame for the dissolution of the "House of Wisdom" on Genghis Kahn's grandson, Hulagu Kahn. But to attribute the demise of intellectual activity in Baghdad to the Mongol conquest is to MASSIVELY misread history. Jafar al-Mutasim (the man largely

responsible for the precedents that accounted for the subsequent wane of the "Golden Age") reigned in the 9th century. The Mongols did not arrive in Baghdad until 1258–four centuries later. (!)

So one can't help but wonder: Insofar as intellectual activity existed, what transpired in Baghdad during that intervening four centuries? In a nutshell: not much. It should be noted that Al-Ghazali had spread his anti-intellectualism in the late 11th / early 12th century: well over a century before a Mongol set foot in Mesopotamia. {3}

The process of deterioration was clearly widespread. When it came to Persia / Mesopotamia, this was a period historians sometimes refer to as the "Iranian Intermezzo". For it was a time when the Abbasid heyday had passed, and the Empire was on the wane…whilst the Buyyids, Fatimids, and finally Seljuks squabbled over the Mesopotamia and the Levant. The storied Seljuk "beg", Tughril, finally took control of the Baghdad in 1055. Under Seljuk rule, Baghdad was left in languor, as the Seljuks were severely encumbered by the (seven) taxing Crusades waged in the Levant between 1095 and 1254 (with still more to come). By the time the Mongols arrived, the beleaguered city was hardly the fount of intellectual vibrancy it had once been.

That…and, as we'll see, the Mongols PRIZED intellectual activity, and eagerly embraced new (exogenous) knowledge; in stark contrast to those they conquered. Far from wanting to stifle scholarship, they went out of their way to support it.

Let's look at some other indications of this (deleterious) sea change. It is worth noting that during Baghdad's heyday, all of the most renown Muslim scholars did their work IN BAGHDAD. In the late 8th century it was Al-Farazi. In the 9th century it was Al-Khwarizmi and Al-Kindi. In the 10th century it was Al-Razi and Al-Farabi.

Starting in the 11th century, however, the most prominent intellectual figures were no longer working out of Baghdad. Rather they tended to be found in:

- Eastern Persia (as with Avicenna, Al-Biruni, and Omar Khayyam)
- Basra (as with Alboacen)
- Damascus (as with Ibn al-Nafis)
- Cairo (as with Ibn al-Haytham)

During this time, the most profound concentration of intellectual activity was in the faltering Andalusia. Behold: Ibn Hazm, Albucasis, Arzachel, Avenzoar, Jabir ibn Aflah, Al-Jayyani, Ibn Tufail, and–most famously of all–Averroës. Even so, Muslim dominance on the Iberian peninsula started to wane in the 11th century; and the thinkers in that area were only able to flourish until the late 12th century.

It might even be said that Andalusia was the last bastion of the Islamic epoch of cosmopolitanism; as the last vestiges of intellectual vibrancy could only be found THERE. Granted, minor religious works like the "Tarikh Baghdad" by Al-Khatib (11th century) and the "Manaqib Baghdad" by Ibn al-Jawzi (12th century) were composed by Hanbalis in Baghdad. Yet…being as they were hyper-traditionalists, their patriarch (Ahmed ibn Hanbal) was an ADVERSARY of those who made any effort to revitalize the "Bayt al-Hikma".

In other words: Islamic zealots had only contempt for the (more intellectually liberal, if politically illiberal) Mutazila. As such, prominent figures during this time were primarily concerned with proselytization; not with scholarship. {9}

Hence there is a certain hypocrisy (or ignorance) when it comes to fundamentalists of the Hanbali strain

NOW boasting about the glory days of the "House of Wisdom"…as if their legacy had anything to do with it. Their progenitors were responsible for ENDING the "Bayt al-Hikma".

In the 11th century, Seljuk vizier, Abu Ali Hasan ibn Ali of Tus (a.k.a. "Nizam al-Mulk") opted to set up a network of theological schools known as "Nizamiyyahs". This was primarily done to provide a bulwark against the promulgation of (Shia) Isma'ilism. It should be no surprise, then, that Nizam al-Mulk appointed the notorious Salafi proselyte, Al-Ghazali (doyen of anti-intellectualism) to a high post in the Baghdad branch. Nizam al-Mulk was eventually assassinated. (There are different theories as to why; but the most plausible is that he converted to Shiism, thereby displeasing his patrons.)

By the time Al-Ghazali came to in Baghdad c. 1092, the climate of open inquiry and intellectual curiosity had already been deteriorating. Whatever intellectual activity may have lingered, Al-Ghazali decisively vanquished. For the three years Al-Ghazali was in the city, he taught at the "Nizamiyyah" (read: at a madrasah, NOT at the House of Wisdom); and used his prodigious clout to ensure his puritanical strain of Islam prevailed. {3} And–tragically–prevail it did.

By the early 13th century (i.e. two generations before the Mongols arrived in Mesopotamia), the dissolution of intellectual activity was also apparent in Egypt and Syria. The Ayyubid sultan, Al-Malik al-Kamil (a.k.a. "Meledin") prohibited the ulema in both Cairo and Damascus from studying / teaching ANYTHING but the sunnah, fiqh, and approved Koranic exegesis. He even went so far as to expel students of philosophy and the natural sciences–which were derided as the heretical "sciences of the Ancients".

But what about the Mongols?

It helps to look at the timeline of Bayt al-Hikma's demise: The LATEST major figures to be associated with intellectual activity in Baghdad did their work in the late 10th century. The Mongols seized the city in the latter half of the 13th century.

To recapitulate the timeline: Long before the Mongols arrived in Baghdad in 1258, the open, intellectual climate that had enabled the "Golden Age" in Dar al-Islam was no more. There was only room left for hidebound ideologues. Jonathan Berkey notes that "Baghdad in the early 11th century was the scene of repeated communal violence, as partisan crowds of Sunnis and Shiites traded attacks on people and institutions associated with the different religious communities, in part as a result of a more strident Sunni traditionalism promoted by the Abbasid caliph Al-Qadir and others."

Berkey adds that "chronicles describing Baghdadi life in the 11th century reveal instances in which Hanbali crowds reacted violently to, say, the preaching of a sermon rife with rationalist theology. [Pressure from such traditionalists] convinced the Hanbali scholar, Ibn Aqil in 1072 to renounce publicly the Mutazili principles with which he had earlier toyed" (ibid.; p. 190, 195).

It makes sense, then, that the migration of Persian scholars FROM Iraq and al-Sham TO Anatolia primarily occurred in the 12th century. In other words, the exodus of intellect OUT OF Bagdad occurred a century before the Mongol invasion. (It is also telling that in the 12th century, the Seljuks chose Hamadan rather than Baghdad as their Western capital.)

What may have incensed the fundamentalists the most was the rationalists' attempt to offer naturalistic (worldly) explanations to why things happen. For those who subscribed to the Ashari creed, such inquiries were verboten. All occurred due to god's will ("hukm" in Classical Arabic). Period. There was no need to grasp any more than that singular fact. The ascension of this Reactionary mindset ensured that Asharism

(read: Salafism) became the prevalent creed. (I explore this in my essays on the history of Salafism.)

And so it went: Any need for one to try to figure things out for oneself was rendered obsolete. "God has already figured everything out. Anything that happens is god's bidding, so what more is there to say?" To square this stance with reality, the Asharites posited "occasionalism"–whereby natural causality was denied (as it undermined the infinite freedom attributed to god). Since only god can be the cause of anything, the physical world must be seen as a sequence of events–every one of which was explicitly willed by god. No need for science to explain things. "It's god's will" is all anyone needs to know.

Divine ordinance explains EVERYTHING. All you'll ever need to know is in the Koran (and Sunnah).

The most famous promulgator of this regressive ideology was al-Ghazali. Al-Ghazali was adamant on the point that any/all critical inquiry (derided as "innovation") was the enemy. His message was quite simple: All the work has already been done for us by an omnipotent super-being. After the Final Revelation, there's nothing left to question.

Thus: If one is looking for a singular figure to blame for the dissolution of Islam's "Golden Age", one should look to Al-Ghazali, not to Ghengis Khan. {3}

Alas, Islamic apologists seek an excuse for the demise of Islam's heyday that enables Dar al-Islam to save face; and so they use the Mongols as a scape-goat. Indeed, they would much rather countenance such farce than place the blame squarely where it belongs: at the feet of Muslim Reactionaries. If it were acknowledged that a regression to Islamic fundamentalism had been responsible for the deterioration of Muslim society, then those disposed to Salafism would lose one of their greatest rationalizations for their cause: a return to the glory days. {47}

And so it goes: The "just blame the Mongol invasions" trope is an evasive maneuver–a way to elide the actual explanation for the demise of Islam's "Golden Age"…and thus to save face. Hair-razing tales about hordes of grotesque half-men-half-horse savages soon proliferated. (This vulgar portrayal persisted to the present era, as attested by the derogatory term, "Mongoloid".)

The perfidy here is jaw-dropping. For the atrocities of Islamic Turko-Mongol tyrants (such as Tamerlane) are blithely projected back onto their Tengri-ist forebears. In fact, it was only MUSLIMS who were razing libraries and burning manuscripts before, during, and after Islam's Pyrite Age. The Seljuk Turks burned over 10,000 priceless ancient manuscripts at the Armenian "matenadaran" (storehouse) at Baghaberd in 1170; and thereafter pillaged the great "matenadaran" at Etchmiadzin. This was for explicitly religious reasons. It was not about fighting people; it was about eradicating IDEAS.

As we've seen: By the late 12th century, the intellectual vibrancy of Baghdad had already begun to peter out. And it should come as little surprise, then, that there is little record of much intellectual activity flowing out of Baghdad during its Seljuk period. {9} By the time the Mongols seized the city, it had already degenerated to a state of intellectual desolation. The reasons that it had degenerated were plain to see: religious fundamentalism from WITHIN Dar al-Islam.

To suppose that Baghdad was thriving right up until the day Hulagu Khan arrived at its gates is to engage in flights of fancy. Far from an efflorescence abruptly ending the day the Mongols sacked the city, Baghdad's heyday had already come and gone. Using Mongols as a scape-goat for Muslim dereliction (before the Mongols even arrived) is–at best–tremendously disingenuous. It is only a wonton historical ignorance that allows this bromide to persist.

In any case, it is clear that Hulagu had no problem with people of other Faiths; nor with scholarly pursuits.

Heck: His wife, Dokuz was a (Syriac) Nestorian Christian. Hulagu's Faith was a syncretism of Syriac Christianity and residual elements of Tengri-ism. In addition to his wife, his general (Kitbuqa), and his mother were all Nestorian; something with which he had no qualms. His successor, Abaqa Khan allied with the Crusaders in the 9th Crusade (spec. with King Edward of England in 1271), besieging Krak des Chevaliers in February 1281 with the Hospitallers of Margat. Clearly, Tengri-ism had nothing to do with the RELIGIOUS antagonism at play; as–being Tengri-ist–he was unconcerned with holy crusades of ANY kind.

The Mongols damaged much of the city during their take-over; but this was NOT because they were looking to destroy libraries. Many of the books lost during the Mongol attack on Baghdad were destroyed due to fires resulting from the fighting. To wit: The loss was a matter of collateral damage; not of some concerted attempt to eliminate heretical material. As it happened, the extent of destruction was attributable to the on-going, staunch resistance of the Abbasids.

In other words, the devastation in Baghdad in 1258 was not gratuitous; it was the unfortunate result of violent warfare.

In an effort to lay the dissolution of Bayt al-Hikma at the feet of the Mongols (and thus blame the demise of Islam's Golden Age on Dar al-Kufr), many Muslim historiographers exaggerate the number of civilians killed during the seizure of 1258. Some say as many as TWO MILLION civilians were slaughtered, more than TEN TIMES the most probable number. Moreover, Muslim historiographers like to say that it was during this siege that Bayt al-Hikma was destroyed.

There is no evidence for this.

While the damage to Baghdad was (tragically) extensive during the Mongol take-over, obviously not everything was destroyed. After all, we STILL HAVE the fruits of the scribes' efforts from Bayt al-Hikma! Eliminating such material was not on the Mongols' agenda. This is attested by the NON-destruction of the storied the "Mustansiriya[h]" madrasah. Even as the Il-khanate damaged much of the city in 1258 in the course of their assault, this institution of higher learning was not damaged. In fact, not a single book was lost. We know this because when the Ottomans captured Baghdad in 1534, THEY seized all the books in the Mustansiriya; and it was THEN that the hallowed institution was shut down. In other words: A that point, an institution still existed TO BE shut down.

In fact, immediately upon establishing control over the city, Hulagu commissioned the famous observatory at Maragheh in northwestern Persia: the "Rasad Khaneh"…***where he had a giant library built to house all of the books from Bayt al-Hikma. (!)***

Just over a year prior to arriving at Baghdad, Hulagu had overtaken the city of Alamut (in northern Persia), ***where he left the great library fully intact***. Shall we presume, then, that in the following year-plus (leading up to the siege of Baghdad), Hulagu decided that he suddenly had something against books?

When Hulagu DID arrive at Baghdad, it is very telling what he did NOT opt to do. He left fully intact the "Nizamiyya" network of Seljuk pedagogic institutions–which were allowed to continue operation after the Mongols seized the city. And it bears worth repeating: He left fully intact the renown Mustansiriya–replete with its grand library. (We might note that the Nur al-Din "bimaristan" [medical school] in Damascus was also undamaged, and continued to operate.) Clearly, eradicating scholarship was not something he deigned to do.

One would not know ANY of this by reading most Islamic accounts of the sacking of Baghdad by Hulagu.

The lurid portrayal of the siege is as overwrought as it is cockamamie. Indeed, story-tellers couldn't even decide wether they wanted to say that the Tigris River was running red with the blood of the slaughtered inhabitants OR was turned black with the ink from all the manuscripts that were (supposedly) thrown into the water. One is invited to speculate as to whether the Mongol fighters opted to carry innumerable butchered corpses all the way to the water (to submerge them for some unspecified reason) OR opted instead to carry stacks of manuscripts all the way to the water (in order to destroy them by mass water-logging instead of–well–by simply burning them). Either way, we are told that the river became so full of ***bodies*** and/or ***books*** that one could ride a horse from one bank to the other.

One may as well suppose that, meanwhile, the Euphrates ran white with Tahini.

This is, of course, all zany nonsense; but it makes for an enthralling account–and certainly paints the Mongols as demons. Surely tens of thousands of residents perished in the onslaught (rather than MILLIONS, as some accounts claim). But this loss of life was a result of the caliph, Mustasim's obduracy. The casualties were not only a consequence of his stubborn refusal to surrender in the face of certain defeat, but almost certainly due to his continual taunts and threats to the Mongolian army that was patiently waiting for his surrender outside his gates for several days–as was Mongolian precedent. Technically, not a SINGLE PERSON needed to die in Baghdad due the Mongol take-over. {48}

Tengri-ist / Buddhist Mongolian culture was perfectly fine with embracing the incipient wisdom–and even the traditions–of conquered territories. The Mongols only slaughtered civilians when the civilians ACTIVELY RESISTED. The reason was never racial or religious alterity. {18}

It should also be noted that the Mongol army was not even comprised entirely of Mongols; it consisted of Turks, Armenians, Georgians, Persians, and Chinese. Immediately after taking control of the city, Hulagu even appointed a MUSLIM Persian to lead it: Ata-Malek of Juvayn. Ata-Malek's father had been a minister in the (Islamic) Khwarezmian Empire prior to it being conquered by the Mongols; and was then promptly hired by the new Mongolian rulers to serve in the government–as was Mongol custom.

Another interesting point: Very soon after Hulagu's seizure of Baghdad, the city was under Islamic rule again (in 1295 at the hands of the aforementioned Ghazan), whereupon it was under the vassalage of the Il-khanate. {21} Once this happened, there was no initiative to instigate any program of higher learning.

By stark contrast, when Tamerlane conquered Baghdad in 1401, he COMPLETELY destroyed the city…AND exterminated all its inhabitants. Tamerlane, a devout Muslim, was more renown than anyone else in history for razing libraries. If anyone was determined to destroy all the books in Baghdad (and everywhere else, for that matter), it would have been him. And so he did.

It is also important to note what transpired during the period BETWEEN the twilight of Bayt al-Hikma and the arrival of the Mongols. The Seljuks controlled Baghdad in the early 11th century–starting with the take-over by Tughril: an Oghuz Turk who had recently converted to Sunni Islam. Tughril imposed an Islamic theocracy on the city, purging it of (Buyyid) Shiites…and eliminating anything that was deemed sacrilegious. Then, in 1058, the Shiites managed to regain the upper hand when the (Isma'ili) Fatimids overtook the city. By that time, intellectual activity in Baghdad was already noticeably on the wane. The Mongols would not arrive until exactly 200 years after that. By then, Bayt al-Hikma was long gone. {13}

Interestingly, it was around that time (in the 11th century; in the advent of Avicenna) that "falsafa" [philosophy] began to be incorporated into some Islamic discourse. {14} In his "Al-Shifa" [the Healing], Avicenna strove in vain to reconcile Islam with Reason. Averroës, who lived until just before 1200, made further headway on this front. Over the subsequent centuries (that is: even after the Mongols arrived) the

endeavor lingered on, mitigated only by SHARIA (political imposition of the Sunnah on the populace). The Mongol presence was in no way a deterrent to scholarly activity. ***If anything, they kept it alive for longer than it might have been sustained under Sunni rule.***

The primary repercussion of the Mongol invasion of Baghdad was an end to the (tyrannical) Abbasid caliphate. Ironically, it is thanks to the Mongols' acceptance of foreign books that we are now aware of Bayt al-Hikma AT ALL. {10} This irony is often lost on historical revisionists who are bent on demonizing the Mongols; and determined to mis-characterize Mongolian hegemony as an intellect-stifling phenomenon.

Had anyone said to someone in Bagdad at the end of the 13th century, "The Mongols are preventing everyone here form scholarly activity, eh?" he would have surely been met with befuddlement. The likely response would have been something along the lines of "What the heck are you talking about?"

DISPELLING ILLUSIONS:

It is plain to see that the wane of the limited intellectual activity within the Ummah had nothing whatsoever to do with the Mongols. If anything, the Mongols were known to have honored–nay, ENCOURAGED and ADOPTED–each newly-acquired community's intellectual achievements. There was no heresy in Tengri-ism.

Rapacious as he was, Genghis Khan was never inclined to burn a book or raze a library. Ever. Once. In fact, he was renown for consulting local holy men in his newly acquired territories; and even appointing competent figures in subdued cities to administrative positions. This modus operandi persisted until the Mongol-Turkic regimes of the world converted to Islam…at which point, ethnic affiliation was ALL that mattered.

So what happened to Baghdad after the Mongol seizure in 1258? As it turns out, the city was promptly reconstructed; and it ended up flourishing under the Il-khanate. In other words: Not only did some imagined heyday of Baghdad NOT exist right up until the day Hulagu arrived (and then suddenly end); the city actually underwent a revitalization thereafter.

If anything, we should be thanking the Mongols for what survived; rather than vilifying them for their (admittedly rapacious) conquests. Unsurprisingly, Muslim historiographers typically fail to note that Baghdad was REVITALIZED under the Il-khanate, and soon became a thriving cosmopolitan center–though not quite to the extent that it had been centuries before, during the Mutazila epoch.

(Note: The Il-khanate remained a mixture of Tengri-ist, Tibetan Buddhist, Zoroastrian, and Nestorian Christian until Ghazan took power in 1295.)

By the time the Mongol imperium ruled the Middle East, they were ESTABLISHING schools. This civic enterprise was not solely for the elite. Mongol leaders were actively promoting universal literacy; and so instituted public education to that end. In the late 13th century, under the direction of Kubilai Khan, the school of astronomy and medicine at Tabriz (Persia) was established, where Muslim luminaries like Rashid ad-Din ended up studying. (I debunk other myths in Appendix 3. For more on the positive role the Mongols played in the Middle East, see my essay: "The Universality Of Morality".)

To Recapitulate: The Mongols were not engaged in a religious crusade; and they had no interest in eradicating the intellectual achievements of other cultures. They were predominantly Tengri-ists–who were, incidentally, monotheists; and utterly unconcerned with evangelism. {11} Mongols harbored no

contempt for cultural / intellectual achievements of conquered peoples; and more often than not, actually EMBRACED those achievements. This makes perfect sense, as Tengri-ism ["Boo Morgol"] was inherently pluralistic. To be a Tengri-ist (worshipping the god of the eternal blue sky) was to NOT CARE what religion others happened to be. Thus Keraite Empress [Khatun / Bekhi] Sorghaghtani was a renown intellectual and stateswoman; and her adoption of a "foreign" Faith in was in no way a problem for her husband, Tolui Khan (son of Genghis Khan).

In sum: The Mongols had no truck with other cultures' sacred beliefs. In fact, the Mongols had a long tradition of religious tolerance, prizing the scholars in conquered territories; and openly adopting the knowledge of other cultures. {18} Naturally, this attitude included a toleration of alternate religious traditions. {12} In fact, Hulagu's mother–arguably the most revered woman in Mongol history–adopted Syriac Christianity with nary the bat of an eyelash from the Mongol rulers.

This conduct might be contrasted to what the (MUSLIM) Turkic-Mongol warlord, Timur of Kesh (a.k.a. "Tamerlane") did to Baghdad when he sacked it in 1401 (the year after he committed genocide in Armenia and Georgia). After massacring the populations of Aleppo and Damascus for EXPLICITLY RELIGIOUS reasons (revenge for the murder of Rashidun caliph, Ali's sons: Hasan and Husayn), Tamerlane ordered a mass-beheading campaign in Baghdad–largely targeted at non-combatants, including women. Such a measure clearly had no practical utility.

The point cannot be emphasized enough: There was no such thing as a Tengri theocracy. Even with the most notorious instance of slaughter (Genghis Khan's sacking of the Khwarezmian city of Urgench in 1221), the only casualties were PEOPLE; not culture, not infrastructure. The slaughter–which was extensive and largely gratuitous in scope–occurred during the course of active battle. That is to say, it was a military act, not a pogrom; undertaken as a military strategy (that is: to make a statement: We are not to be fucked with). As mentioned earlier, soon after the Mongol take-over of [Old] Urgench, the city became more of a thriving–and pluralistic–cultural mecca than ever before. Under Mongolian rule, it was even allowed to become a center for Sufism. (!)

When it comes to Muslim apologists blaming THE OTHER for the demise of their "Golden Age", this is a crucial point. It was the ISLAMIC FUNDAMENTALIST conquerer, Tamerlane, who later persecuted people for their Faith in Urgench. After Tamerlane seized the city in 1373, it was made clear that he saw Sufism as heretical. Pursuant to a Sufi uprising, Tamerlane razed the city to the ground, ***massacring its entire population***. This was not a military act; it was a pogrom based entirely on a religious agenda. This horrific event is often (retroactively) attributed to Genghis Khan in Islamic historiography–a case of mendacious revisionism.

Tellingly, Tamerlane also massacred the entire population (over 70,000; men women and children) of Isfahan AFTER he'd already conquered it. Why? The city's citizens had the gall to protest the extortionate "jizya" taxes he levied upon them. When he turned to India, he razed Delhi to the ground, massacring the entire population (over 100,000; men, women, and children). Why? They were Hindu; and it was the will of "Allah" that all had to die.

Being an Islamic fanatic, Tamerlane sought to depopulate Christian lands–notably Armenia (undertaking what would be the first of two Armenian genocides perpetrated by Turkic leaders).

Tamerlane slaughtered over 5% of the world's population at the time: about 17 million people. Such a percentage is especially jaw-dropping once we consider that he never even made it into Europe, Africa, or China…let alone the Americas. It is reasonable to assume, then, that he ended up killing an unspeakable portion of the people within his vast dominion. (For more on Tamerlane, see part two of my essay on the

history of Salafism.)

Unfortunately, Tamerlane's atrocities are often confused with the deeds of Genghis Khan and his immediate (non-Muslim) heirs. The truth is that Tamerlane (who was Salafi) was the primary culprit for much of the horror misattributed to Genghis Khan (who was Tengi-ist). Far far far more scholars fled that megalomaniacal Muslim tyrant (seeking refuge beyond his reach) than had fled the Mongols in 1258. In fact, there is no record of ANY significant scholars fleeing Baghdad just prior to–or during–the Mongols' siege. This would have been odd if the Mongols had been known for massacring scholars.

One will search in vain for any record of a great scholar killed in the Baghdad during the siege. The most significant institution the Mongols destroyed in Baghdad was the Abbasid caliphate. Arresting intellectual activity–insofar as it even still existed in the city–had nothing to do with it.

One last thing to bear in mind: If we are to blame Hulagu Kahn (or the Mongols in general) for the dissolution of the Islamic "Golden Age" in the Middle East, how is it that–after Mongol hegemony across Asia–several Muslim luminaries ended up hailing from places that were within the Mongol-conquered domain? Most notable was Jalal ad-Din Muhammad (later known as "Rumi"), who ended up spending most of his adult life in the (Seljuk) Sultanate of Rum. Rumi grew up in the city of Balkh, in Khwarezmia (i.e. Bactria), which was taken over by Genghis Khan when the former was only twelve years old. That was in 1220. {16}

When Rumi migrated to Anatolia eight years later (in 1228), he was not fleeing Mongol oppression; he was simply going to where "the action" was at that point in history (in Konya, which was the Sultanate's capital at the time). As legend has it, the Sultan himself (Kayqubad) extended a personal invitation to Rumi's father. Thus the decision to migrate was prompted more by an invitation than a pressing need to flee. Ironically, just fifteen years later (1243), Konya came under control of the Mongols–becoming a vassalage of the Il-Khanate. Nevertheless, Rumi spent the next three decades there, producing his most well-known works. His followers were even able to found a new Sufi Order–in his name–upon his death.

Clearly, the Mongol presence in the region did not prevent thinkers–Muslim and otherwise–from rising to prominence…and flourishing. (Again: This makes sense, as Tengri-ism was not an oppressive religion.) In fact, potentates who happened to be ethnic Mongols only became oppressive AFTER converting to Islam (as most blatantly attested by Tamerlane–who, it might be noted–would raze Rumi's native city to the ground in 1339).

The record is quite clear that pluralism was–and STILL IS–germane to Tengri-ism. And the record is equally clear that pluralism is antithetical to unreconstructed Islam. This stark juxtaposition tells us everything we need to know about what REALLY happened. It is a sad commentary on the knowledge of world history TODAY that this is news to anyone.

DEBUNKING MORE MYTHS:

In order to cultivate an accurate understanding of what Islam's Pyrite Age really was (and what it was NOT), it is necessary to debunk some of the popular myths that surround it. Let's assay four of the most prevalent falsehoods that proliferate to the present day. First: The development of what came to be called "algebra". Second: The development of what came to be called "Arabic numerals" (replete with the use of "zero" and of a decimal system). Third: The invention of the astrolabe. Fourth: Contributions to the progress of medicine.

Let's look at each in turn.

ONE: Arguably the most famous thinker associated with the "House of Wisdom" was the Persian polymath, Mohammad ibn Musa of Khwarezm (a.k.a. "Al-Khwarizmi), who made advances in algebra in the 9th century. He did not, as some say, INVENT algebra. Due to this one figure, it has become a trope in Islamic lore that the modern world has Muslims to thank for algebra. As we'll see, this is not true.

It was the Indians who first formalized what would later be dubbed "algebra". Yet the genesis of a generalized system for expressing and solving equations can actually be traced back to ancient Babylon. Babylonian thinkers developed arithmetical processes by which one can perform calculations in an algorithmic manner. They even used formulae for finding solutions to problems that would later be solved using linear and quadratic equations.

So as early as the Bronze Age, prodigious headway was made in ancient Egypt as well. Indeed, the hypothetical-deductive method so integral to science originated among ancient Egyptian priests. Notably, the mathematician, Ahmose of Thebes / Kerma composed the "Rhind" papyrus c. 1650 B.C., which laid the groundwork for algebra and Euclidian geometry.

In Axial Age China, the "Mo Jing", the "Jiu-zhang Suan-shu", and numerous texts associated with Sun Tzu broke new ground in mathematics.

In the 4th century B.C., Eudoxos of Knidos [Caria] pioneered (what would later be called) Cartesian equations with his "Kampyle of Eudoxus". Meanwhile, Thymaridas of Paros studied linear equations. Then Menaechmos of Thrace developed equations for parabolae, hyperbolae, and ellipses (the study of conic sections).

Most famously, Greek mathematician, Euclid of Alexandria pioneered the generalization of formulae (beyond simply finding solutions to specific problems) with his "Elements" c. 300 B.C. (a work that also pioneered geometry). Other Hellenistic mathematicians like Hero of Alexandria and Archimedes of Syracuse pioneered trigonometry.

In the 3rd century B.C., the Indian mathematician, Pingala penned the "Chanda-shastra", in which he explicated what would later be called "Pascal's Triangle" (a way of representing of binomial coefficients). Meanwhile, in China, scholars composed the "Chiu-chang Suan-shu" [Nine Chapters on the Mathematical Art] c. 250 B.C.

In the 2nd century B.C., Hipparchus of Nicaea (Bithynia) pioneered trigonometry. Then Theodosius (also of Bithynia) penned "Sphærics", in which he expounded on how to calculate the volume of a sphere.

Fast-forward to the 3rd century A.D. Diophantus of Alexandria penned his "Arithmetika", in which he presented 130 algebraic problems (primarily quadratic equations), and procured numerical solutions to determinate equations; while evaluating indeterminate equations.

The Islamic world clearly made use of this work. How can we be so sure? A cache of manuscripts for the entire corpus–composed IN KUFIC SCRIPT–were discovered at the 10th-century library of "Asta[n]-Quds-Raz[a]vi" at Mashhan in Khorasan. (They seem to have been translated by the Melkite mathematician, Qusta ibn Luqa of Baalbek in the 9th century.)

In the late 5th / early 6th century, Indian mathematician, Arya-bhata of Kusumapura / Pataliputra [Bihar] laid further groundwork for algebra and trigonometry with his magnum opus, the "Ashmaka-tantra" [Book

of Solutions; later rendered “Aryabhatiya” in Classical Arabic]. Further work in trigonometric functions was done by Varaha-mihira.

Two centuries ***before*** Al-Khwarizmi wrote his magnum opus (the “Compendious Book on Calculation by Completion and Balancing”), the great Indian mathematician, Brahma-gupta of Rajasthan [Gurjurata] pioneered algebra and geometry–especially the treatment of quadratic equations. His magnum opus, the “Brahma-sphuta-Siddhanta” included an explication of the quadratic formula. As it turns out, Brahma-gupta’s landmark work was produced the year that Mohammed of Mecca slaughtered the Jews of Khaybar (c. 628).

The very next year (while Mohammed was attacking the Ghassanids at Mu’tah), the Marathi mathematician, Bhaskara of Maharashtra found solutions to the algebraic “Pell” equations AND resolved the sine function in trigonometry. He also elaborated upon Arya-bhata’s work. Al-Khwarizmi composed his magnum opus TWO CENTURIES after that.

Thinkers in Dar al-Islam were well aware of their indebtedness to the achievements of Indian mathematicians. Al-Fazari’s celebrated work on trigonometry and astronomy (the “Zij al-Sind-Hind”) from the late 8th century was–doubly–named after the land of the Hindus (the Sindh); and was explicitly based on Indian methodology. (We have a record of this last work thanks to the 12th-century English natural philosopher, Adelard of Bath.) Tellingly, Muslims LATER re-titled this work, the “Zij ala-Sini al-Arab” in order to elide the origins of its insights. This had the added effect of leaving people with the impression that Indian numerals were to be considered “Arabic” numerals (as we’ll see below).

Work on trigonometry was also done (in Baghdad) by Wabash al-Hasib al-Marwazi c. 800. And a contemporary of Al-Khwarizmi (the Jain mathematician, Maha-vira “Charya” of Karnataka) pioneered algebra with his “Ganita Sara Sangraha”, wherein he devised complex algebraic identities, new ways to manipulate fractions, and formulae for the area and perimeter of ellipses. That was in the 840’s. Suffice to say: By the time Al-Khwarizmi lived, it was well-known that the field had been pioneered by the Indians.

Thus the celebrated Muslim icon picked up where earlier pioneers had left off. Al-Khwarizmi penned the “Kitab al-Mukhtasar fi Hisab al-Jabr wa’l-Muqabala” between the 820’s and 830’s. In it, he made some contributions to “algebra” (as it would later come to be known, via the Romanized “Algebræ”). {5} His work focused primarily on solving quadratic equations. The exposition was distinct in that he employed words instead of symbols. In other words, his disquisition was more rhetorical in nature than it was rigorously mathematical.

Al-Khwarizmi also elaborated upon the aforementioned work by “Arya-bhata” on pi (as it was used for calculations of areas and volumes). Alas, it would not be long before the myth that Al-Khwarizmi had “invented algebra” caught on; and soon thereafter, the Europeans who made use of his book forgot about the accomplishments that preceded him.

It was c. 900 that Abu Kamil Shuja ibn Aslam solved three non-linear simultaneous equations with three unknown variables. Further work on trigonometry was done by Persian astronomer, Abu al-Wafa al-Buzjani in the late 10th century. And, working off of the work of Diophantus, the Persian mathematician, Abu Bakr Muhammad ibn al-Hasan of Karaj (a.k.a. “Al-Karaji”) pioneered the manipulation of polynomials, giving the first formulation of binomial coefficients c. 1000.

It was not until the late 11th century that the renowned Persian polymath, Omar Khayyam of Nishapur (a protege of Avicenna) made further advances–notably: solving quadratic and cubic equations.

We should bear in mind that none of this had anything to do with fealty to Islamic doctrine. In sum: Such insights had much more to do with exceptional PEOPLE than an exception AGE.

TWO: Some Muslims today like to take credit for the Indian decimal system–misleadingly referring to the numerals as "Arabic". Such commentators may wish to consult a major work by the above-mentioned Persian mathematician, Al-Khwarizmi–which was helpfully entitled: "On the Calculation with Hindu Numerals". Also revealing is the title for his other landmark work: "The Book of Addition and Subtraction According to Hindu Calculation" (composed in the 820's). Considering this, it should come as little surprise that the renown Italian pedagogue, Baldassarre Boncompagni, would later refer to Al-Khwarizmi's work on algorithms as "The Hindu Art of Reckoning".

The popularization of characterizing Indian numerals as "ARABIC" numerals seems to have begun with commentaries by the Italian mathematician, Leonardo of Pisa (a.k.a. "Fibonacci"). The irony is that Fibonacci was explicit in specifying the ACTUAL origin of the numerical system. In his magnum opus, "Liber Abaci" (1206), he introduced what he referred to as the "modus Indorum" [Indian method]. Alas, the misnomer "Arabic numerals" caught on nevertheless. It has stuck every since.

The history of this subject is quite interesting. Indians had established precursors to the numeric system in the 3rd century A.D.–as attested by the Bakhshali manuscript. It was even the Indians who pioneered the formal use of "zero" (an Arabic morpheme, but originally referred to as "sunya" in Sanskrit). There had been a Babylonian-inspired version of zero going back to Hipparchus of Nicaea during Classical Antiquity. Meanwhile, there was a version of zero used by the Tang (Chinese) mathematical treatise, "Sunzi Suan-jing" from the 3rd century A.D. In India, the first major appearance of zero was likely in the Jain treatise, "Loka-vibhaga" c. 458 A.D.

It was in the late 5th century, Arya-bhata of Kusumapura / Pataliputra [Bihar] developed the numerical system–replete with zero, negative numbers, and a decimal system–which he used to represent the value of pi in his "Ashmaka-tantra" [Book of Solutions] As already mentioned, that work also included early work in both geometry and algebra; and would later be rendered in Arabic as the "Aryabhatiya". The system would eventually be adopted by the Arabs; and mislabeled "Arab numerals" by the Europeans…who worked from material gleaned from the Muslim world.

Bottom line: The numerals used throughout the world today, which are often referred to as "Arabic numerals", are actually INDIAN numerals. {15}

THREE: Islamic apologists often (erroneously) cite the 11th-century Andalusian instrument-maker, Abu Ishaq Ibrahim al-Zarqalluh (a.k.a. "Al-Zarqali"; "Arzachel") as the "inventor" of the astrolabe. It's worth reviewing the history of this amazing technology.

The Chinese had been using compasses since the 4th century B.C. And the Vikings had perfected the device for marine navigation by c. 800.

The earliest version of the astrolabe was purportedly invented by Apollonius of Perga in the late 3rd century B.C. The first astrolabe of renown was a design by Hipparchus of Nicaea from the 2nd century B.C. The device was then refined by Theon of Alexandria in the 4th century A.D. His storied daughter, Hypatia was credited with design contributions as well (also in the 4th century).

During the lifetime of Islam's prophet, the great Syriac scholar, Severus Sebokht of Nisibus is known to have made further advances in the (extremely useful) device. Alas, the first MUSLIM credited with modifying designs of the instrument was the son of the celebrated Persian scholar, Ibrahim al-Fazari

(named Mohammed). That was not until the late 8th century. Incidentally, it was THAT Persian father-son team that adopted the Indian numerical system by translating works by Indian mathematicians into Classical Arabic, entitled "Zij al-Sind-Hind"–thereby rendering what is now (misleadingly) called "Arabic numerals". (That project was commissioned by Abbasid caliph, Al-Mansur.)

During the Islamic "Golden Age", there was an efflorescence in the design of astrolabes–naturally, as Dar al-Islam had come to encompass the Mediterranean Sea–and was engaging not just in trade, but conquest and piracy on the high seas. (Incidentally, the primary trade was the SLAVE trade.) Needless to say, there was a high demand for navigation technology; so it would have been odd if they had NOT engaged in maritime innovations. Unfortunately, the primary use of the device in Dar al-Islam was in Barbary corsairs for the purpose of pillaging and enslavement.

It is worth noting that the Arabic term for the device, "asturlab" comes from the Greek "astrolabos". Had the Arabs invented the device, they surely would have come up with their own name.

FOUR: To put advances made in Dar al-Islam in context, it is worth reviewing the progress of the medical sciences. There was, indeed, some sporadic headway made in medicine in the Muslim world; but, less often mentioned, the majority of it was a reflection of advances that had been made much earlier…in foreign lands. For example, the need for sanitization in surgery had been recognized as far back as the 22nd century B.C. by the Sumerians.

Famed Indian physician, Sushruta of Varanasi / Taxila made major medical advances c. 600 B.C. (ref. the "Shushruta Samhita"). Shortly thereafter, Charaka of Gandhara (known as the Father of Medicine) composed his landmark works. Indeed, the "Chakara Samhita" was the first treatise to establish ethical codes in medical practice.

Later, Hippocrates of Kos made groundbreaking discoveries (e.g. the need for antiseptics) c. 400 B.C. In the late 4th century B.C., the Mauryan sage, "Chanakya" (alt. "Kautilya") served in the court of the Kushan king, Kanishka the Great. (He is sometimes referred to as "Vishnu-gupta", as he is also said to have also advised the great Mauryan king, Chandra-gupta during his capacity as teacher at the great university of Taksha-shila.) He pioneered the philosophy of medicine known as "ayurveda".

The Chinese "Huangdi Neijing" (basis for herbal medicine) was compiled in the 2nd century B.C.

In the 1st century A.D., Greek physician, Pedanius Dioscorides of Cilicia compiled a massive pharmacopoeia, "De Materia Medica"; while the Indian sage, Bharadvaja Barhaspatya composed his "ayurveda" treatise.

In the 2nd century A.D., Roman Pyrrhonist, Sextus Empiricus made major medical advances at the school in Alexandria. And in the 5th century, the Byzantine thinker, Aëtius of Amida made significant contributions to medical thought.

By the time Mohammed of Mecca was undertaking his ministry, Aaron of Alexandria was breaking new ground in medicine with his "Pandects" (which were promptly translated into Syriac); and Alexander of Tralles had composed his "Twelve Books On Medicine". Meanwhile, the Kashmiri "ayurveda" scholar, Vagbhata of Sind made contributions to medical thought in the Far East.

Around the time Mohammed of Mecca was undertaking his ministry, Isadore of Seville was composing his 20-volume compendium of all human knowledge: the "Etymologies", which sought to bring together all the world's scholarship. This offered far far far more insight into the natural world than anything in the Koran or Hadith. {51}

Yet for centuries after Mohammed's death, the Muslim world remained steeped in daffy superstition–as is illustrated by the famous (yet medically worthless) 9th-century opus, "Al-Risalah al-Dhahabiah" [The Golden Treatise] by Ali ibn Musa al-Ridha (a.k.a. "Imam Reza"). Commissioned by Abbasid Caliph, Al-Ma'mun, the treatise was largely about the so-called "humors"–a theory popularized by Galen of Pergamon. {4}

Limited headway was then made by the Persian physician, Al-Razi (mentioned forthwith) in the 10th century; yet this added very little of note to medical knowledge. It was at this time in China that vaccination was first used (as an inoculation against smallpox); a method later employed during the Ming Dynasty.

The purported medical insights of the Persian physician, Ali ibn al-Abbas al-Majusi of Ahvaz (a.k.a. "Haly Abbas") were also wanting. His "Kitab Kamil al-Sina'a al-Tibbiyya" [Book of the Complete Art of Medicine] primarily concerned protocols for medical practice (with focus on the relationship between doctor and patient). That is to say, his contributions had largely to do with etiquette (e.g. bedside manner); not so much with medical knowledge.

When Avicenna (finally) wrote the first pioneering work in medicine in the Muslim world, the "Qanun fi at-Tibb" [Canon of Medicine] in the 11th century, he was working off the translated works of Sushruta and Hippocrates. Unfortunately, he was co-opting (spurious) material from Galen as well. The same goes for Abu al-Wasim al-Zahrawi (a.k.a. "Albucasis", author of the "Kitab at-Tasrif") in the late 11th century; and then Avenzoar in the early 12th century. Alas, cribbing from others' work was commonplace throughout the Muslim world.

The 13th-century expositor, Ibn al-Nafis is a celebrated figure in the history of medicine; yet his work (the "Theologus Autodidactus") was preceded by the advances of the Italian physicians, Hugh and Theodoric of Lucca.

By the early 14th century, Guy de Chauliac had written his landmark work, "Chirurgia Magnus". This was also when the Persian physician, Sadid ad-Din Muhammad ibn Mas'ud of Kazarun / Fars earned renown–though HIS contributions were primarily a matter of writing commentaries on the works of the aforementioned Avicenna.

Often, when Muslims DID try to offer advise on (medicinal) remedies based on the teachings of MoM–rather than on, say, Hippocrates, it was little more than balderdash. Case in point: the writings of Mamluk commentator, Al-Dhahabi of Damascus in the 14th century.

So when Claude Bernard composed his "Introduction to the Study of Experimental Medicine" in the early 1860's, his insights were gleaned via exclusively secular means. Clearly, NO religion–let alone Islam–had anything to do with any of the progress made in this field at any point.

Here's the thing: The Koran and Hadith make no mention of germs or infection. This is an elementary insight that would have forestalled endless–and eminently avoidable–death and suffering over the course of many centuries. It should come as no surprise, then, that for over a millennium after Mohammed's ministry, the Muslim world was using a panoply of dubious medieval "remedies" that had no bearing whatsoever on genuine medicine.

The fact of the matter is that almost all of the Muslim icons now referred to as "physicians" were hardly men of science. Most were analogous to such famed ersatz "physicians" as the 4th-century Gallic healer, Marcellus Empiricus of Burdigala [Bordeaux] (who promulgated folk-remedies rather than practicing bona

fide medicine). Such healers invoked magic more than they offered scientific insight. Both inside and outside Dar al-Islam, such "apothecaries" proliferated in ancient times; and are hardly worthy of celebration.

Thus four major myths about Islam's "Golden Age" are debunked. By this point, it should be clear that there is no such thing as Indian science or Persian science or Greek science or Roman science…or Judaic / Christian / Hindu / Buddhist / Zoroastrian science…let alone ARAB or ISLAMIC science. There is only SCIENCE.

ASSAYING THINGS IN A GLOBAL CONTEXT:

The hyper-romanticized portrayal of a "Golden Age" fall apart once we realize that "Bayt al-Hikma" was not a unique phenomenon in the ancient world.

The legacy of a State-facilitated cultivation of knowledge goes back to Babylon during the 2nd millennium B.C. In the advent of scribes becoming a major profession, much of the Mesopotamian population became literate. By the 1st millennium B.C., during the course of the Assyrian / Babylonian / Persian Empires, there were libraries in most municipalities; and both men and women were taught to read and write. Freedom to compose whatever material one wished was allowed–as attested by the fact that much of the Hebrew Bible was composed by Jewish scriveners in Babylon during the Exilic Period.

Major institutions of higher learning emerged during Classical Antiquity. Here are FORTY of the most renown that preceded Islam's Pyrite Age:

- The Ionian school at Miletus (6th century B.C.)
- The Indian university at Taxsha-shila [alt. "Taxila"; in Punjab] (6th century B.C.)
- Plato's Academy, followed by Aristotle's Lyceum, at Athens (4th century B.C.) {20}
- Phaedo's Elian School; later Menedemus' Eretrian School (4th century B.C.)
- The imperial (Qin) Qi-Xia [alt. Jixia] academy at Yinqui in China (4th century B.C.)
- The Museion at Alexandria in Egypt (3rd century B.C.) {6}
- The Museion at Pergamon [alt. the library at Pergamum] in Aeolia (3rd century B.C.)
- The Sammatiya "migadaya" at Isipatana [Sarnath] in India (2nd century B.C.)
- The national (Han) legal school at Chang'an in China (c. 136 B.C.)
- The Imperial (Han) "Tai-xue" academy at Chang'an in China (c. 3 A.D.)
- The Athenaeum at Rome (late 1st century A.D.)
- The Kushan school at Mathura (2nd century)
- The Catechetical "Didascalium" at Alexandria; as well as the School of Antioch (2nd century)
- The Sassanian "Sarough" [alt. "Sarouyeh"; library] at Isfahan in Persia (2nd century)
- The Assyrian (Nestorian) school at Edessa (2nd century); followed by that at Nisibis (c. 350) in Anatolia
- The Sassanian "daneshgah" [medical academy] at Gundishapur [alt. "Jundeshpur"] in Persia (3rd century) {22}
- The Talmudic academies ["yeshivas"] of Mesopotamia: at Sura, Pumbedita, and Nehardea (3rd century) {23}
- The Neo-Platonist school at Apamea in Syria c. 300
- The "matenadaran" at Etchmiadzin in Armenia was one of the greatest storehouses of manuscripts in Late Antiquity (4th or 5th century)
- The Byzantine Pandidakterion at the Palace Hall of Magnaura in Constantinople; founded as a school of medicine, philosophy, and law (c. 425).

- The maha-vihara at Vallabhi in Saurashtra [Gujarat] (c. 600)
- The imperial (Tang) “Small Wild Goose Pagoda” at Chang’an in China (7th century)
- The Indian “maha-viharas” at Uddanda-pura (“Odantapuri” in Bihar), Telhara, Vikram-shila, Kuruk-shetra, Pushpa-giri (Odisha / Orissa in Utkala), Jagaddala (Varendra in Bengal) and–most famously–at Nalanda in Bihar (8th century) {24}
- The (Carolingian) Urbs Regale at Aachen in Germany (8th century)
- The Bengal maha-vihara, “Somapur[a]” at Paharpur[a] (c. 800)

This brings us to the 9th century, during which there were four major institutions founded–one of which was Islamic (though more of a Shia religious school than a university):

- The (Idrisid) “Al-Qarawiyyin” madrasah in Fez, Morocco (c. 859)
- The Preslav Literary School (est. in Pliska c. 885) and Ohrid Literary School (est. the next year) in Bulgaria {25}
- The medical school at Salerno, Italy (late 9th century)

Needless to say, Bayt al-Hikma was nothing new. In fact, it would have been rather odd for a major empire to NOT have developed a (sanctioned) curation program at some point. What is telling is that this laudable institution did not endure. Why not? The Sunnah. (For university-foundings thereafter, see Appendix 2.)

There is a reason that nobody contends: “If only the great universities of Renaissance Europe had devoted more time to teaching sacred scripture [Judaic, Christian, OR Islamic], Europe would have been so much better off!” Au contraire, it was because Europe was BREAKING FREE FROM (de rigueur) beholden-ness to church doctrine that headway was made. (Indeed, progress in Europe and North America can only be attributed to the emancipation of society from Roman Catholic dominion.) If only the Ummah had undergone marginal secularization as well, it might have followed suit. In a certain sense, the “Golden Age” of Islam was an aborted Renaissance.

Meanwhile, we should recall how Europe was plunged into the Dark Ages IN THE FIRST PLACE. {44}

But that’s just institutions of higher learning. What of LIBRARIES? Of course, many of the above institutions were known for their libraries–as with the Great Library of Alexandria (replete with the Serapeum, a school of higher learning that included lecture halls) from the 3rd century B.C. {6}

The earliest libraries date back to c. 2500 B.C. with those at Nippur and at Ebla. They were followed by the Hittite archives at Hattusa and the Amorite archives at Mari (both c. 1900 B.C.) Ten other ancient libraries of note:

- Sargon of Akkad is said to have erected a library at Agade (i.e. Akkad) in the 17th century B.C.
- The library at Nuzi c. 1500 B.C.
- The library at Ugarit c. 1200 B.C.
- The Great Assyrian Library of Ashur-banipal at Nineveh in the 7th century B.C.
- The Vivarium of Bruttium, founded by Roman statesman Cassiodorus in the 6th century B.C.
- The library at Ctesiphon (unknown, Classical Antiquity)
- The royal archives of the Qin palace at Xian-yang (unknown, Classical Antiquity)
- The Syrian library at Antioch, founded by the Greek poet, Euphorion of Chalcis [Euboea], at the behest of Antiochus the Great, in the 3rd century B.C.
- The great library at Pergamum [Aeolia] in the 3rd century B.C.
- The great Villa of the Papyri at Herculaneum in the 1st century B.C.

That accounts for what were likely the fifteen largest libraries before the common era. This brings us to Late Antiquity. Here are six more notable libraries that preceded the Abbasids:

- The Greco-Roman library at Kos c. 100
- The Greco-Roman library of Celsus at Ephesus from the early 3rd century
- The Roman (theological) library at Caesarea Maritima in Palestine from the early 3rd century
- The Syriac "Dayro d-Mor Mattai" on Mount Alfaf (near Mosul) c. 363
- The Imperial (Byzantine) library at Constantinople from the 4th century
- The (Smartha) Kaila-sanathar Temple at Kanchi-puram (Tamil Nadu, India) had a library dating to the 7th century

Already mentioned were the great Indian libraries at Taxsha-shila and Nalanda–both from the 8th century (both destroyed by Muslim conquerers). The Judaic library of Geniza was established at Fustat (Cairo) in Egypt c. 870.

The Barmakids (originally a Buddhist clan from Balkh) rose to prominence in **the 9th century**. They commissioned the translation of myriad texts from Sanskrit (into Syriac and/or the newly-established Classical Arabic); and even had a paper mill constructed to maximize dissemination.

In the 10th century, the Benedictine monastery at Cluny (France) became one of the great storehouses of Europe's ancient manuscripts. It ended up being one of the few places that heretical documents were not destroyed by the Catholic Church.

The "Bayt al-Hikma" came and went. As Baghdad's "House of Wisdom" was about to enter its denouement, the (Vietnamese) Ly Dynasty established the "Van Mieu" [House of Literature] in Hanoi c. 1070. Also founded during the last days of Islam's Pyrite Age was the "Jagaddala" maha-vihara at Varendra in Bengal.

During the Middle Ages, there also existed the great Nizari (Isma'ili) fortress at Alamut in Daylam (northern Persia), which contained a vast library. There is a myth that the books there were all destroyed when Hulegu arrived in 1256. But this cannot be true. For according to Marco Polo's travelogue, the fortress boasted "impressive libraries whose collections included books on various religious traditions, philosophical and scientific texts, and scientific equipment." Marco would have visited the fortress just after 1300–long after the Mongol seizure. {32} It is more likely to have been destroyed by the (Islamic) Seljuks. To reiterate: The Mongols were not known for ever burning books. They craved knowledge and respected other cultures.

The renown Library of Corviniana was commissioned by the Hungarian King, Matthias Corvinus in the 15th century.

So how unique was Islam's "Golden Age"? Revisiting ancient history helps put this fabled epoch in perspective. We might start with the endeavor to combat dogmatism, which preceded even the fabled Athenian pedagogue, Socrates. The Indian school of empiricism / skepticism, Lokayata (a.k.a. "Brhaspatya"; "Charvaka") was founded by the philosopher, Ajita Kesakambali c. 600 B.C.

The Thracian polymath, Democritus wrote "On History", "On Nature", "The Science of Medicine", "On The Tangents Of The Circle And The Sphere", "On Irrational Lines And Solids", "On The Causes Of Celestial Phenomena", "On The Causes Of Atmospheric Phenomena", "On Reflected Images"…and on and on. He was the first to propose the atomic theory. That was in the 5th / early 4th century B.C. Alas. NOT ONE of these works survived the (Roman Catholic) book-burning mania of Christendom. {50}

The Roman Epicurean, Lucretius was one of the first to conjecture biological evolution–noting in his "On The Nature Of Things" that nature proffered many species of animal which seemed to have useful characteristics–traits suitable for its ability to survive, thrive, and reproduce successfully. Those who lacked such traits, he noted, "law at the mercy of others for prey and profit…until nature brought that species to destruction."

Moving on through the Epicureans, Stoics, and other anti-dogmatists of Greco-Roman thought, the legacy of critical inquiry continued into Late Antiquity. In the 3rd century, Carian philosopher, Alexander of Aphrodisias taught at the Peripatetic school in Athens; while Porphyry of Tyre studied there.

And in Alexandria, Neoplatonist thought thrived–producing figures like Ammonius Saccas, Origen "the Pagan", Cassius Longinus, and Plotinus. Meanwhile, there were mathematicians like Diophantus and Pappus.

In India, Buddhist scholar Dignaga pioneered "pramana" (epistemology; especially in the field of deductive reasoning) in the early 6th century A.D. His "Pramana-samuccaya" dealt primarily with "anumana" [Reason]. Meanwhile, the indian mathematician, Vira-hanka discovered the Fibonacci pattern of numbers.

Armenian polymath, Anania Shirakatsi and Andalusian thinker, Isidore of Seville were both contemporaries of MoM. The Benedictine monk, Bede of Northumbria expressed intellectual curiosity when he composed "On The Nature Of Things" in the late 7th / early 8th century. Then, another Benedictine monk, Rabanus Maurus of Mainz composed his own "On The Nature Of Things" in late 8th / early 9th century.

Fast forward to the Middle Ages. We might note the great thinkers outside Dar al-Islam yet in the Orient during this period. In India / Kashmir alone, there was:

- Philosopher, Sridhar Acharya of Radha (8th century)
- Jain logician, Akalanka (8th century)
- Philosopher, Jayarasi Bhatta [ref. his great work of skepticism, "Tattva-opa-Plava-Simha"] (late 8th / early 9th century)
- Jain polymath, "Acharya" Virasena (early 9th century)
- Jain mathematician, Mahavira "Charya" of Bihar (9th century)
- Nyaya philosopher, Jayanta Bhatta of Kashmir (9th century)
- Pratyabhijna (Shaiva) philosopher, Utpala-deva of Kashmir (10th century)
- Mathematician, Aryabhata II (10th century)
- Mathematician, Halayudha of Manyakheta (10th century)
- Logician, Udayana-charya of Mithila [Bihar] (10th century)
- Astronomer, Sri-pati (11th century)
- Philosopher, Gangesha Upadhyaya of Mithila [Bihar] (12th century)
- Indian (Gujarati) mathematicians, Gopala and Hema-chandra (12th century)
- Indian mathematician / astronomer, Bhaskara II of Bijapur / Karnataka (12th century)

Meanwhile, the Irish Gaelic Neoplatonist, John Scotus Eriugena composed his "Division of Nature" in the 9th century. And in the 10th century, heterodox Frankish expositor, Abbo[n] of Orléans [associated with the Fleury Abbey] championed critical thinking.

During the 11th century in China alone, there could be found great thinkers like:

- Shen Kuo of Zhe-jiang [a.k.a. "Meng-qi"]

- Zhou Dunyi, Cheng Hao, and Cheng Yi [a.k.a. “Zheng-shu”] of Luo-yang
- Shao Yong of Henan [a.k.a. “Yaofu”]
- Zhang Zai of Chang’an
- Su Song of Fujian
- Wei Pu of Kai-feng

Then, in the 12th century, there emerged in China such luminaries as Zhu Xi of Fujian and Lu Xiang-shan [a.k.a. “Lu Jiuyuan”]. If the Creator of the Universe was seeking to focus his endowment of insight on Dar al-Islam, he certainly had a funny way of doing it. Indeed, during the Middle Ages, throughout the non-Muslim world, there was plenty of intellectual flourishing.

So what of the ESTIMABLE occurrences in Dar al-Islam during its Pyrite Age? It is well-known that from c. 800 through c. 1200, the Muslim world was significantly ahead of Christendom when it came to science. However that juxtaposition in and of itself is misleading. For the Muslim world was ahead BY DEFAULT; as the Roman Catholic Church GUARANTEED an intellectually benighted Europe–ensuring that the continent remained mired in religionism (read: ignorance) for over a thousand years. Thus the Holy Roman Empire was EVEN WORSE OFF than Dar al-Islam…until, that is, the European Renaissance.

That long, sluggish process by which the Occident emerged from the interminable bog of superstition that was Christendom was kicked off by Reformers–nay, radicals. Just as in Dar al-Islam, those in Europe who made headway managed to do so IN SPITE OF, not because of, their religious environs. They achieved what they did by extricating themselves from the dogmatic quagmire in which they found themselves.

It was in the 9th century that the Mutazilis [“those who secede” from the mainstream emerged, and some injected intellectual rigor into Dar al-Islam. Note that they were not characterized by ORTHODOXY, but by their DEPARTURE FROM orthodoxy. They privileged Reason (esp. independent thinking) over revelation (nay, dogmatism in general). Caliph Al-Ma’mun departed from precedent, and encouraged this (heterodox) approach to religiosity. Its champion was the Persian philosopher, Abu Bakr Zakariyya of Rey (a.k.a. “Al-Razi”; Romanized to “Rhasis”), who taught in the early 10th century.

As Baghdad flourished, in Dar al-Kufr, the Renaissance was yet to get underway. Yet by the 12th century, things were starting to look up. The great natural philosopher, Adelard of Bath had gained notoriety in England–and had even garnered some knowledge about astronomy from his travels in the Muslim world (he could read Arabic). Yet he did not have RELIGION to thank for his verging erudition–as is made quite clear in his magnum opus, “Questiones Naturales”.

In early 1200’s, the Dominican friar, Vincent of Beauvais compiled the 80-volume compendium of human knowledge: “The Great Mirror”. And in 1206, the Italian mathematician, Leonardo of Pisa (a.k.a. “Fibonacci”) published the “Liber Abaci”.

Meanwhile, the scientist, Robert Grosseteste wrote his landmark work on mathematics and the natural sciences, “De Lineis, Angulis et Figuris” in the 1220’s. (This established the scientific method.) Grosseteste was the mentor of the renown Franciscan friar, Roger Bacon, who would make major contributions to the scientific method in the 13th century (ref. his “Opus Majus”). Soon thereafter, the Bavarian polymath, Albertus Magnus of Cologne helped pave the way for subsequent thinkers. Michel de Montaigne, who’s “Essais” broke new ground in anti-dogmatism in 1580.

As it so happened, the first time there occurred any effort to facilitate quasi-secular education in post-Pyrite Age Dar al-Islam was in 1227. That was when Abbasid caliph Al-Mustansir commissioned a madrasah for higher learning in Baghdad (thereafter known as “Mustansiriya Madrasah”); which–incidentally–was left

undamaged in the Mongol sack of the city 31 years later.

In terms of the extent of preservation of ancient wisdom in “Bayt al-Hikma” (and the degree to which we should be grateful for what was done within its walls), we should bear in mind: We are only aware of the limited number of documents the Islamic scribes DID opt to preserve; not the untold amount of documents that were destroyed. In fact, it is quite likely that the vast majority of extant material was destroyed. We’ll never know how much. So to characterize this as some exalted enterprise to preserve all the world’s knowledge is disingenuous. Indeed, it is remarkable what material was NOT destroyed. We might thank a handful of diligent scribes for the gesture; but we should be under no illusions that the caliphs were devoting their time to reading Aristotle and celebrating the achievements of Classical Antiquity.

The fact remains that the handful of great thinkers in the Muslim world during the Middle Ages who DID manage to make some headway did so because they were great thinkers, not because they happened to be Muslim. {31} They were, after all, noteworthy for being so astoundingly exceptional; which means they were EXCEPTIONS.

In Dar al-Islam, there was a delimited pseudo-Renaissance of sorts. So it is important to see where and when (and HOW) this occurred. The best way to do so is to survey Muslim luminaries during the epoch-in-question (late 8th century thru 13th century). In doing so, we should note the temporal concentration of thinkers during Islam’s Pyrite Age; as well as the two geographical concentrations: Persia (from Basra to Bactria / Khorasan) and Andalusia. It is no coincidence that Muslim luminaries tended to operate in cosmopolitan centers.

Temporally-speaking, the demise of Islam’s Pyrite Age coincided with (Occidental) Renaissance. Subsequently, virtually all progress in Europe could be attributed to the process of secularization known as the Enlightenment–the centers of which were in Scotland / England and Germany (not coincidentally: where the Reformation occurred) as well as in France.

n the midst of Christendom, there were some forays into free-thought. In the late 12th / early 13th century, Duns Scotus pioneered philosophy; while Robert Grosseteste of Suffolk pioneered the scientific method. Albert “the Great” of Cologne–as well as his student, Thomas Aquinas–incorporated Aristotelian thought and Neo-Platonism into their disquisitions in the 13th century.

In the 14th century, other forays were made with English thinker, William of Ockham…as well as with French thinkers like John Buridan of Picardy and Nicole Oresme of Normandy. Such headway was made IN SPITE OF, not because of, any ambient religiosity. {40}

The same went for the Muslim world. The salutary achievements of the few luminaries were not ISLAMIC achievements, they were HUMAN achievements. Each was made by someone who happened to be–to one degree or another, in one way or another–part of the Muslim world. Such figures were invariably HETERODOX thinkers; far from being emblematic of the “conventional wisdom” that permeated their environs. Let’s now turn to a survey of these exceptional individuals. {33}

THE EXCEPTIONS PROVE THE RULE

In enumerating luminaries in the Muslim world, it is important to bear in mind the fundamental distinction between “in spite of”, not “because of”…just as we would in a Christian context. We don’t thank Lutheranism for the achievements of Johannes Kepler, Carl Friedrich Gauss, and Werner Heisenberg. Why not? Because their Lutheran Faith had absolutely nothing to do with their intellectual achievements.

Nor do we thank Unitarianism for the achievements of Joseph Priestley, Anglicanism for the achievements of Robert Boyle, or Catholicism for the achievements of Louis Pasteur. {43} And what of Presbyterianism? Are we to attribute the achievements of Thomas Bayes, Lord Kelvin, Michael Faraday, and James Clerk Maxwell to the proselytization of John Knox (let alone to the fanatical ramblings of John Calvin)? Of course not.

Let's start with luminaries outside of Persia. Here are the ***twenty*** most notable (non-Persian) Muslim figures during the era in question (the late 8th century thru 13th century):

- Wasil ibn Ata of Baghdad (late 8th-century Mutazila founder)
- Fatima al-Fihri (an 8th-century Shiite, Berber Muslimah who founded the madrasah of Al-Karaouine at Fez, in Morocco) {34}
- Al-Sabi Thabit ibn Qurra of Harran (9th-century mathematician / astronomer) {35}
- Abu Yusuf Yaqub ibn Ishaq al-Kindi of Basra [a.k.a. "**Alkindus**"] (9th-century polymath; a NeoPlatonist who is sometimes referred to as the Father of Arab Philosophy)
- Abu Abdullah al-Battani of Syria [a.k.a. "**Albatenius**"] (late 9th / early 10th-century mathematician / astronomer)
- Abu Kamil Shuja ibn Aslam ibn Muhammad ibn Shuja of Misr [Egypt] [a.k.a. "**Abu Quamel**"] (late 9th / early 10th century)
- Abu Hasan Ali ibn al-Husayn al-Masudi of Baghdad (10th-century historian)
- Abu Abdullah Muhammad ibn Mu'adh al-Jayyani of Cordoba in Andalusia (late 10th-century mathematician)
- Abu Hasan al-Mawardi of Basra [a.k.a. "**Alboacen**"] (late 10th- / early 11th-century political thinker)
- Abu Qasim Khalaf ibn al-Abbas al-Zahrawi of Cordoba in Andalusia [a.k.a. "**Albucasis**"] (late 10th / early 11th-century physician)
- Abu Ali Hasan ibn al-Haytham of Basra [a.k.a. "**Alhazen**"] (early 11th-century Fatimid scientist who studied in Cairo, known for his book on optics) {30}
- Abu Muhammad Ali ibn Ahmad ibn Said ibn Hazm of Cordoba in Andalusia (early 11th century)
- Abu Ishaq Ibrahim ibn Yahya al-Naqqash al-Zarqalluh of Toledo in Andalusia [a.k.a. "Al-Zarqali"; "**Arzachel**"] (11th-century astronomer)
- Abu al-Salt Umayya of Andalusia [a.k.a. "**Albuzale**"] (late 11th / early 12 century)
- Abu Muhammad Abd al-Haqq al?Ghafiqi al?Ishbili of Seville in Andalusia [a.k.a. "**Ibn al-Ha'im**"] (early 12th-century astronomer)
- Abu al-Walid Muhammad ibn Ahmad ibn Rushd of Cordoba in Andalusia [a.k.a. "**Averroës**" (12th-century polymath) {36}
- Abu Marwan ibn Zuhr of Seville in Andalusia [a.k.a. "**Avenzoar**"] (12th-century physician)
- Abu Muhammad Jabir ibn Aflah of Seville in Andalusia (12th-century astronomer / mathematician)
- Abu Bakr ibn Tufayl of Granada in Andalusia [a.k.a. "**Abubacer ibn Tofail**"] (12th-century polymath) {37}
- "Ala ad-Din" Abu Hassan Ali ibn Abi-Hazm al-Qarshi of Damascus [a.k.a. "**Ibn al-Nafis**"] (13th-century expositor on medicine)

Note the predominance of Andalusians: ten out of twelve between the late 10th and 12th centuries. (This is a startling geographic concentration considering the Muslim world also encompassed north Africa, Palestine, Syria, Anatolia, Mesopotamia, Arabia, Persia, Transoxiana, and beyond the Hindu Kush.)

The intellectual achievements of NONE of these men could be attributed to religiosity. Indeed, the most celebrated (Averroës) was held in contempt by the notoriously Reactionary ulema. Averroës was, above all else, an Aristotelian; and–it might be said–only incidentally a Muslim. It would be utterly absurd to attribute his intellectual prowess to any orthogonal affiliation he may have had with Islam.

Also of note were the three "Banu Musa" brothers of Baghdad, who were known for writing the "Kitab al-Hiyal" ["The Book of Tricks"] in the 9th century (a catalogue of designs for various handy gadgets). {38}

In the late 14th century, the historian, Abu Zayd Abd ar-Rahman ibn Muhammad ibn Khaldun al-Hadrami of Tunis (a.k.a. "**Ibn Khaldun**") made contributions in philosophy of history and sociology (ref. his "Muqaddimah"). Another notable thinker in Dar al-Islam was the polymath, Taqi al-Din of Damascus–an engineer from the 16th century who's research was eventually stopped by the chief mufti of Istanbul. Also from the 16th century was the cosmopolitan Mughal statesman, Jalal ud-Din Muhammad Akbar of Sindh (a.k.a. "Akbar The Great").

Even during Islam's so-called "Golden Age", non-Muslim thinkers of the Orient thrived. In 10th-century Baghdad, some of the most notable writers were Jewish–as with Sa'adiah ben Yosef "Gaon" and Dunash ben Labrat. One of the most renown Arab thinkers of the Middle Ages was Hunayn ibn Ishaq, who was not Muslim. (His son, Abu Ya'qub Ishaq [ibn Hunayn ibn Ishaq] was a well-known translator.) Another notable non-Muslim was the Syriac poet / philosopher, Abul al-Ala of the Banu Sulayman in Maarra (a.k.a. "Al-Ma'arri"), who lived during late 10th / early 11th century. Al-Ma'arri was was a freethinker who spent most of his life teaching in Aleppo. A vociferous critic of dogmatism, he prized Reason over claims of tradition and authority. Reason, he held, was the ultimate moral guide (no need for divine command). He held that virtue was its own reward; no need for the enticements of an afterlife paradise to motivate good people. Al-Ma'arri was a critic of the notion of prophets in particular, and of religion in general. (He not inaccurately referred to the "Hajj" as the pagans' sojourn.)

Al-Ma'arri is thought to have once quipped that "the inhabitants of the earth are of two sorts: those with brains but no religion, and those with religion but no brains." His collection of homilies, the "Fusul wa al-Ghayat" [Paragraphs and Periods] could be considered a parody of the Koran. Despite his status as a "kafir", Al-Ma'arri was permitted to write and teach under the (Shiite) Hamdanid regime, who held him in high esteem. In fact, he was revered as the best poet of his time in the Arab world.

To get a more complete picture of luminaries during Islam's "Golden Age", let's look the most notable ***PERSIAN*** intellectuals between the late 8th and 13th centuries. There are sixteen worth mentioning:

- Abu Muhammad Abdullah Ruzbeh ibn Daduya of Fars [a.k.a. "**Ibn al-Muqaffa**"; who spent most of his life in Basra] (late 8th-century author)
- Abu Musa Jabir ibn Hayyan of Tus / Khorasan [a.k.a. "**Geber**"; "Gebri Arabis"] (late 8th- / early 9th-century polymath; who is now credited for pioneering work in chemistry, yet was primarily concerned with alchemy and distilling alcohol)
- Mohammad ibn Musa of Khwarezm [a.k.a. "**Al-Khwarizmi**"] (9th-century mathematician)
- Ali ibn Sahl Rabban of Merv / Tabaristan [a.k.a. "**Al-Tabari**"] (9th-century physician)
- Abu Bakr Muhammad al-Zakariyya of Rey [a.k.a. "**Al-Razi**"; "Rhazes"] (10th-century polymath, medical pioneer) {39}
- Abu Wafa of Buzhgan / Khorasan (10th-century astronomer / mathematician)
- Abd al-Rahman al-Sufi of Isfahan [a.k.a. "**Azophi**"] (10th-century astronomer)
- Abu Nasr al-Farabi of Khorasan [a.k.a. "**Alpharabius**"] (10th-century polymath)
- Abu Rayhan Muhammad ibn Ahmed al-Biruni of Bukhara / Khwarezm [a.k.a. "**Alberonius**"; a cohort of Avicenna] (late 10th- / early 11th-century polymath)
- Abu Bakr ibn Muhammad ibn al-Husayn of Karaj (late 10th / early 11th century)
- Ibn Sina of Bukhara [a.k.a. "**Avicenna**"] (11th-century Persian intellectual)
- Ghiyath ad-Din Abu'l-Fath Omar ibn Ibrahim al-Khayyam of Nishapur / Khorasan [a.k.a. "**Omar Khayyam**"] (late 11th- / early 12th-century polymath) {41}

- Seljuk astronomer, Abu al-Fath Abd al-Rahman Mansur al-Khazini of Merv (12th century)
- Muhammad ibn Muhammad ibn al-Hasan of Tus / Khorasan [a.k.a. "**Nasir al-Din Tusi**"] (13th-century polymath, pioneer of trigonometry) {42}
- "Mevlana" Jalal ad-Din Muhammad of Balkh / Khorasan [a.k.a. "**Rumi**"] (13th-century Sufi, Persian poet / humanist)
- Muhammad ibn Abi Bakr of Isfahan was known for his enhancements of the astrolabe (13th century)

Each of these men further illustrates the distinction between "in spite of" and "because of" when assessing their intellectual achievements vis a vis any association with a religion. For Muslims to take credit for the intellectual achievements of these luminaries is absurd, if not mendacious.

Until the current (post-war) era, that just about covers it. {19}

After c. 1300, the incidence of scholars in the Muslim world diminished markedly. There were sporadic figures–such as (Hanbali) jurist, Ibn Qayyim al-Jawziyyah of Damascus and French polymath, Levi ben Gerson of Occitania [a.k.a. "Gersonides"] (14th century); then Egyptian polymath, Jalal ud-Din al-Suyuti (15th century). But on the whole, there was a drastic deterioration in the intellectual activity within Dar al-Islam that occurred just as Europe was beginning to emerge from the dogmatic slumber of the Dark Ages (during its "Renaissance").

Make no mistake: It is proper to recognize the (fairly limited) contribution of this handful of men from the Muslim world–especially given the circumstances in which they lived (not exactly an incubator for intellectual blossoming). Meanwhile, we should avoid the temptation to exaggerate their importance. Indeed, we can appreciate them without indulging in hyperbole.

Let's be clear: The aforementioned Muslim luminaries were men who put down the Koran / Hadith for long enough to think for themselves (that is: to engage in critical inquiry). Theirs is a legacy of Progressivism within the Ummah. It is a legacy that can be continued in the present era pursuant to the ushering in of a Reform Islam.

One thing to remember about Islam's fabled "Golden Age" is that whatever headway WAS made within the Muslim world–by men who were Muslim by accident of birth–bested the headway made in Europe during the Dark Ages BY DEFAULT. That is, free-thought (i.e. science and philosophy) was suppressed MORE in the Roman Catholic dominion than it was in Dar al-Islam; therefore the latter fared better in certain respects. The fact that free inquiry was not suppressed AS MUCH in the Muslim world as it was in the Holy Roman Empire (between the 8th and 14th centuries) does not warrant accolades for Islam PER SE. ("***A*** was not as bad as ***B*** during the Dark Ages" does not constitute an argument for ***A***.)

Many of the men listed above were Muslim simply by dint of the fact that Islam was the only game in town. That they managed to do what they did is more a testament to them than to any Faith with which they may have been affiliated. Suffice to say, their enterprise had nothing to do with striking terror into the hearts of non-Muslims (per 3:151 and 8:12/60 in the Koran). Nor were they concerned with hoarding war booty. Nor were they spending their time acquiring sex slaves (per 33:50). They had other things on their mind (thank god). To what might we attribute this laudable (heterodox) "din"? There is no simple answer, as the explanations probably vary from case to case. But one factor that certainly played a role in ALL cases was an emancipation of the mind. Such stalwarts were not tethered to the dictates of ANY sacred texts. Not a single worthwhile insight offered by any of them required the Koran or Hadith. They looked away from religious dogmas for long enough to think for themselves.

The Middle Ages came and went. Francis Bacon wrote a landmark disquisition on the scientific method in

1620: “Novum Organum”. Also in the 17th century were Italian Jesuits like Francesco Maria Grimaldi of Bologna and Giovanni Battista Riccioli of Ferrara. English scientists like Robert Boyle and Robert Hooke made key discoveries.

It is instructive to look at what occurred over the course of the two centuries spanning from the 1660’s to the 1860’s (a.k.a. “the Enlightenment”). For by the mid-17th century, the European Enlightenment was gathering steam. In the wake of Spinoza’s earth-shattering disquisitions (esp. “Ethics” in 1677), Michel of Montaigne’s anti-dogmatic essays, René Descartes’ bold forays into rationalism, and Nicolas Copernicus’ “The Harmony of the World” (as well as Galileo’s empirical validation of his heliocentric model), the stage was set for a major sea-change. Robert Boyle published “The Skeptical Chymist” in 1661. Starting in 1665, the world’s first scientific journal, the “Philosophical Transactions of the Royal Society” was published in England.

Fast-forward two centuries; and we find that human knowledge had advanced significantly. In the advent of Darwin’s disquisitions on natural selection and Mill’s publication of “A System of Logic”, James Clerk Maxwell and Hermann von Helmholtz pioneered the science of electromagnetism. John Stuart Mill published “A System of Logic” in 1843. Charles Darwin published “On The Origin Of Species” in 1859. By the time Claude Bernard published his “Introduction to the Study of Experimental Medicine” in 1865, the scientific revolution was well underway. (It is safe to say that, in proffering his medical insights, Bernard was not using sacred doctrine as a jumping-off point.)

By this time, it was clearer than ever that such prodigious headway was a matter of breaking free from religiosity (that is: bold thinkers who managed to extricate themselves from the dogmatic quagmire that was the Dark Ages).

During this propitious period (between the 1660’s and the 1860’s), we might ask: What, exactly, had occurred in Europe that had not occurred in the Muslim world? In a nutshell: The Enlightenment. While Newton (England), Hume (Scotland), Bernoulli (Switzerland), Diderot (France), Kant (Prussia), and Gauss (Germany) proffered a further understanding of our world, Dar al-Islam languished in a sort of intellectual torpor.

And so it went: In the span of two centuries (from Bacon to Darwin), the Occident had made stupendous progress–and was continuing to make progress at an astounding rate. The progress was enabled by man’s emancipation from institutionalized dogmatism. Even when it occurred within in a religious milieu, headway was made IN SPITE OF–not because of–any given person’s incipient Faith.

The “in spite of” vs. “because of” distinction is crucial–lest we start attributing Newton’s accomplishments to his fascination with alchemy. When the devout Anglican, Florence Nightingale composed her “Notes On Nursing” in the 19th century, she did not base her insights on religious dogmas…any more than had Gregor Mendel derived his insights into genetics from his time at an Augustinian abbey.

The Enlightenment was–if nothing else–a process of secularization. During the same period, Dar al-Islam effectively underwent a retrenchment of religiosity–a doubling down on antiquated principles. Instead of creative destruction, leaders opted for reconstruction-ism (which is to say: they were regressive rather than progressive). At the time, a revitalization of Mohammedanism–primarily in the service of Ottoman aggrandizement–was seen as the best way to re-invigorate Dar al-Islam. Such revanchism was essentially an UN-enlightenment. Hence it would have been inconceivable for there to have been, say, a Voltaire in the Muslim world during this period.

During the Dark Ages, Christendom stagnated due to being submerged in a dogmatic (read: religious)

quagmire. The Islamic “Golden Age” (what I call its Pyrite Age) was a time when the Muslim world triumphed over Christendom BY DEFAULT. This was not an indication of how intellectually-stimulating Islam can; it was a thunderous reminder of how intellectually-stifling Christian theocracy has been. For a few centuries, the Orient looked positively marvelous when juxtaposed against the intellectual torpor of the Occident. After all, mediocre can appear positively stellar when compared to downright awful. While the Roman Catholic imperium was busy burning most books, Muslims were allowing many ancient texts to be curated. Such disparities indubitably leave the latter in a far superior light.

However, things don’t appear quite as impressive when Islam’s Pyrite Age is juxtaposed against, say, Song China. China had been championing rational thought (in both science and law) since the Mohism of Classical Antiquity.

By the 3rd century B.C., the Chinese had pioneered water irrigation. The Sichuan engineer, Li Bing of Qin, designed the Dujiang-yan irrigation system–the largest planned public works project the world had ever seen–in the year 268 B.C. {55} By the 2nd century A.D., the Chinese were using paper. During the period with which we are concerned here, Chinese technological innovations included gunpowder, water-pumps, the pound lock, the suspension bridge, the cross-bow, the magnetic compass, and–most importantly–the movable-type printing press. The Song Dynasty surpassed the Abbasids in State-support for public works as well as for research in the natural sciences.

The stagnation of the Muslim world was attributable in large part to hidebound religiosity. It should have come as little surprise that the Ottoman Empire–addled by an abiding beholden-ness to religious impresarios–would collapse at the beginning of the 20th century…in the face of secularism.

CONCLUSION:

The bucolic, intellectually-vibrant candy-land of Islam’s heyday is a risible farce peddled by the most delusive apologists for hyper-traditionalism in Dar al-Islam.

The renown of the so-called “House of Wisdom” was based more on the curation / cooption of extant knowledge than on the generation of new knowledge. As we’ve seen, SOME headway was made (most notably, in formalizing algebra); but few major REVOLUTIONARY ideas emerged. After all, there was not a single subversive element to be found in that institution’s history. The boldest thinking in Dar al-Islam ended up occurring in Persia (Avicenna) and Andalusia (Averroës). {13}

Bayt al-Hikma performed a valuable service in preserving some of the works of Antiquity. Alas. While curation is a laudable enterprise, it is not the same as creation. In any case, whatever headway WAS made in the Muslim world, it turns out, was severely circumscribed by doctrinal concerns. Marked advances were made in optics; yet instead of being used to make telescopes (to further astronomy) or to make microscopes (to further biology and chemistry), such advances were put in the service of more accurately calculating the beginning / end of Ramadan (and the precise timing of daily salat) and for more accurately determining the direction of the qibla (as attested by the use of so-called “zij” guides). And so much of the intellectual capital that WAS garnered by a handful of stalwarts was heedlessly squandered on sacralized inanities. It should come as no surprise, then, that, even during its Pyrite Age, Dar al-Islam was still languishing in a geo-centric worldview.

Meanwhile, improvements were made to the astrolabe for marine navigation. But the nautical device was primarily used to better undertake acts of piracy in the Mediterranean Sea–replete with the largest slave-trade the world had ever seen. Up until the 19th century, corsairs were attacking ships and bringing

booty–including captured humans–back to Al-Jaza?ir ("Algiers") for sale.

Interestingly, even as Andalusia was the region in which intellectual activity primarily flourished during Islam's "Golden Age" (pace the "Bayt al-Hikma" in Bagdad), the universities now there were not established until AFTER the "Reconquista" of the 15th century. That is: Spanish Universities did not emerge until after Islam was expurgated from the Iberian peninsula. The University at Granada was founded in 1531. A university would not appear in Toledo until the late 19th century. And Cordoba would not have a university until 1972. (!)

Tellingly, institutions of higher learning in Baghdad and Damascus would not appear until the 20th century. The first major school of higher learning founded in the Muslim world was the Ottoman Imperial School of Naval Engineering at Istanbul–established by Sultan Mustafa III in 1773. The school was dedicated to ship-building and cartography, primarily for military purposes. There was no other science–let alone philosophy–in its curriculum.

In the 19th century, Egyptian reformer, Rifa'a al-Tahtawi introduced Egyptians to Enlightenment ideas such as secular government, civil rights, and individual liberty; championing ideas of the public good as integral to civil society (in the tradition of European Enlightenment philosophers). His work catalyzed what has been dubbed the "nahda" (the short-lived, pseudo-Renaissance in the region). {52}

There are inordinately FEW intellectual achievements that came out of the Muslim world during Islam's heyday–considering its geographical expanse and its duration of time. In a sense, then, what is conventionally referred to as Islam's "Golden Age" may be more accurately called its "Pyrite Age". After all, it transpired during what is accurately referred to as the DARK AGES. The epoch's primary claim to fame concerned imperial power (i.e. territorial conquest). {53}

From MoM's lifetime to c. 1900, there were under forty noteworthy (intellectual) luminaries in the Muslim world. Their work occurred in the span of the six centuries–the six centuries leading up to the High Renaissance (at which point, such occurrences within the Ummah virtually cease). {54} Each of these figures illustrates an important point: Religiosity can transcend the contents of a holy book. It is important to distinguish between "because of" and "in spite of" when we view people in a religious context.

Religious fundamentalism–Islamic or otherwise–has always stifled the cultivation (and obstructed the procurement) of arete. The history of Judaism demonstrates this. The history of Christianity (esp. Roman Catholicism) demonstrates this. {28} And the history of Islam demonstrates this. {29} Fortuitously, the rare luminary in the Muslim world looked up from his sacred scriptures for long enough to actually figure a few things out. Such insights were gleaned primarily on the shoulders of those who "got the ball rolling" from outside Dar al-Islam.

A Reform Islam would enable Muslims to rise above the benighted intellectual morass inaugurated by Al-Ghazali and the Asharites. {3} However, one cannot work to solve a problem that one does not admit exists. As I hope to have shown in this essay, one elides the diagnosis for the dissolution of Islam's "Golden Age" by shifting the blame from an incursion of doctrinal Islam (at the time of the dissolution) to invading foreigner armies (centuries later). It was fundamentalist Islam, not "Mongol hordes" or a DEPARTURE FROM the Sunnah, that explain the demise of "Bayt al-Hikma" in particular, and the deterioration of Dar al-Islam in general.

FOOTNOTES:

{1 "Bayt" mustn't be confused with "bay'at", which means "oath of allegiance". Note that a colloquialism for warehouse in the Maghrebi dialect is "makhzen" [literally: place used as a treasury]. "Bayt" was used in various ways–as with the the caliphs' treasuries: "bayt al-maal" [house of wealth]. Other than "bayt" (household; emphasizing the group of people within), a common Arabic term for house is "dar" (abode; in the sense of a structure or a domain). This makes sense, as abode has intimations of a sanctuary; a place to feel "at home". (See footnote 26 below.) In the Koran, heaven ["Jannat"] is variously described as "Dar al-Salam" [Abode of Peace] and "Dar al-Akhirah" [Abode of the Hereafter]. "Bayt" is a variation on the Semitic "bit", from which the Hebrew "beit" (Romanized to "beth") is also derived. (See footnote 2 below.) Thus one of the (fascist) Judean Settler Movement's illegal settlements is called "Be[i]t El" [House of God]–reminding us that Judeo-Supremacy is, at root, theocratic. ("Beth-El" is, unsurprisingly, also the name of an institute specializing in Revisionist Zionist propaganda.) Solomon's fabled temple was actually called the "Beit HaMikdash" (i.e. House of the Abrahamic deity). The same idiom is found in Arabic. Notably, "bayt-ullah" [house of god] is an alternate name for a mosque; while "ahl al-bayt" ["people of the house"] is the moniker used to refer to MoM's family.}

{2 The Old Semitic lexeme for house, "bit" may have had Akkadian origins. The palace of Aramaean King Kapara of Guzana (c. 1,000 B.C.) was known as "Bit Hilani" [House of Pillars]. That was likely Old Aramaic. For further discussion of the term, "Beth Israel", see my essay: "The Land Of Purple". The Arabic word for domicile (i.e. domestic abode) is "manazil".}

{3 For more on the deleterious influence of Al-Ghazali, see part one of my essay on the history of Salafism. Any "Golden Age" that may have occurred in the Muslim world would have occurred IN SPITE OF, not because of, degenerate thinkers like Al-Ghazali.}

{4 Why the obsession with this errant Roman physician, better known as "Galen of Pergamon", rather than with (the far more valuable) Hippocrates of Kos? It seems that, during the Middle Ages, denizens of Dar al-Islam were far more partial to certain superstitions (e.g. predestination, arrow-tossing, alchemy, astrology, geo-centrism, demonology, etc.) than to others (e.g. precognition, spirit-channeling, animal sacrifices, hexes, exorcisms, witch-burning, etc.) Why some superstitions rather than others? Simply because the former superstitions are prevalent in the Koran; the latter are not. To put it plainly: It was their decision to follow the Koran's queue that led them so astray. A plethora of examples of the Koran's scientific errancy are enumerated in the monograph.}

{5 Note that "algebra" is simply a Romanization of the Arabic term for the completion / restoration (i.e. transposition) of equations ["al-Jabr"]. The terms in the title of Al-Khwarizmi's magnum opus ("al-Jabr" and "al-Muqabala") were rendered "Al-Gebræ" and "Al-Mucabola" in Latin. (Meanwhile, the term "algorithm" is a Romanized bastardization of the author's name: "Al-Khwarizmi".) As it happened, in seeking sources of wisdom, thinkers like Al-Khwarizmi spent much more time sifting through Indian, Persian, and Greek manuscripts–which, it turned out, offered a bounty of insights–than in perusing the 114 Surahs of the Koran…which, it would have become immediately clear, offered no help whatsoever.}

{6 The Great Library of Alexandria was also an academy of science and philosophy. The renown institution endured through the 4th century A.D., and boasted such luminaries as Hipparchus, Euclid, Hero, Philo Judaeus, Archimedes, Eratosthenes, Diophantus, Theon, Hypatia, and the great (Pyrrhonic) skeptic, Sextus Empiricus. We know why there are no traces of the extensive works of Hero of Alexandria or Hypatia of Alexandria to be found in the Arabic translations. In the 390's, (Roman Catholic) Emperor Theodosius had the great library of Alexandria (the Museion, replete with the magisterial Serapeum) all-but-razed, destroying much of the material inside. (Julius Caesar had done extensive damage to the library in the 1st century B.C.; yet the institution persisted for centuries thereafter.) But it was the Rashidun

Caliph Omar [ibn al-Khattab ibn Nufayl] who, in 642, finished the job–destroying whatever was left. The caliph is said to have used the rational: "If those books are in agreement with the Koran, then we have no need for them. And if they are opposed to the Koran, then destroy them." Since the Koran did not yet exist as a unified work at the time, this is probably not a direct quote. (See footnote 7 below.) What the apocryphal proclamation DOES tell us, though, is that this was the sentiment embraced by the powers-that-be then and THEREAFTER. Today, Boko Haram and Daesh are echoes of this very attitude–a continuation of an odious legacy that dates back to the Salaf. (See my essay on the history of Salafism.)}

{7 The "Recitations" were–at most–a collection of orally-transmitted sayings, not a holy book. For more on this point, see my essays on the Syriac origins of the Koran.}

{8 The Mutazili sect was more affiliated with Shiism than with Sunnism. It may come as little surprise, then, that the only sectors in which scientific / philosophical inquiry tended to subsist were Shiite–as attested by the most renown Persian polymaths: Al-Farabi, who was supported by the Shiite Hamdanids; and Ibn Sina (a.k.a. "Avicenna"), who was supported by the Shiite Samanids and Shiite Kakuyids. Also note Hasan ibn al-Haytham of Basra (a.k.a. "Alhazen"), who was supported by the Shiite Buyyids (vassals of the Seljuks) and the Isma'ili (Shiite) Fatimids. (See footnote 30.) Even during Islam's Pyrite Age, Sunnism had very little to do with any intellectual achievements that may have occurred in the Muslim world. Throughout the Sunni realm, madrassas were chartered under the auspices of "waqf" [religious endowment], which meant that they were legally obligated to hew to the pieties ordained by the powers-that-be. A rigid religious curriculum was enforced as a matter of course; and patrons were obliged to toe the line. Rote memorization was the sine qua non in such "places of learning". Free inquiry was inimical to such a program. Critical thinking was out of the question. Norms of scholarship were thus unable to coalesce. To wit: Every measure was taken to ensure than another Avicenna would not occur. To thank Dar al-Islam for Avicenna, then, would be to confuse "in spite of" with "because of".}

{9 Abd al-Rahman [ibn Ali ibn Muhammad Abu al-Farash] ibn al-Jawzi played an integral role in propagating the Hanbali creed in Baghdad during the 12th century. His primary vocation was denouncing heretics in the public squares (i.e. upholding the practice of the "taqfiris"). Al-Jawzi's disdain for the liberalism of Mu'tazili thought was captured in his screed, "Talbis Iblis" ["Delusions of Iblis"; alt. the Devil's Delusion]. Note that it was during this time that the reactionary icon, Al-Ghazali rose to prominence. There were signs elsewhere that the Pyrite Age was in decline–as with the rise to prominence of the staunch reactionary, Ibn Taymiyyah, shortly thereafter.}

{10 The fact that we now have much of what was in Bayt al-Hikma cannot be attributed to second-hand accounts from other places. This is for the obvious reason that if we are only aware of certain information because it was found elsewhere, there is no reason to attribute its survival to the existence of Bayt al-Hikma. We know that so much was curated at Bayt al-Hikma because we have evidence that it came from Bayt al-Hikma; which, in turn, means its contents were not destroyed (i.e. by the Mongols). As it turns out, we DO know what happened after Hulagu Khan captured the city in 1258. He immediately had most of the books transported to his new capital at Maragheh, where he had a NEW LIBRARY built (as part of the magisterial astronomical observatory, "Rasad Khaneh"). We might ask: FOR WHOM did he build the new facility? As it turns out, he did it for an Isma'ili (Muslim) scientist: Muhammad ibn Muhammad ibn al-Hasan of Tus (a.k.a. "Nasir al-Din Tusi"). Indeed, Nasir al-Din Tusi pioneered trigonometry under the Hulagu's patronage. This bore prodigious fruit, as is documented in the groundbreaking "Zij-i Ilkhani" [Astronomic Tables of the Il-khanate], which were promoted by Hulagu's (Buddhist) heir, Abaqa Khan. So any claim that the Il-khanate ended scholarship in the Muslim world is completely unfounded. It exhibited avid interest in FACILITATING scholarship…by people of ALL Faiths. Later, the great observatory at Samarkand (erected for the "mirza", Ulugh Beg) would be modeled on the observatory at Maragheh.}

{11 Tengri was equated with the sky. He was the godhead–worshipped over all things. Alas, it has become fashionable in the modern age to demonize what is depicted as the barbaric "Mongol hordes". This vulgar, worn-out trope is a gross mischaracterization of Mongolian culture. The Mongols were, indeed, ferocious conquerers; but no more-so than several other hegemonic empires. (Funny how we rarely hear of Macedonian or Roman "hordes".) It is arguable that if Tengri-ism had continued to become the world's preeminent monotheism (transplanting the Abrahamic monotheisms), the world would now be a much better place. (Imagine a world without the Roman Catholic Church!) Alas. Demonization of "the other" is par for the course when constructing a self-ingratiating historiography. This is why few people flinched with the depiction of the Persians in the film "300", who–in reality–hailed from a far more sophisticated culture than did the Spartans. Westerners were fine with the portrayal of the Greeks as valiant men defending their cherished homeland against a scourge of grunting ogres. In fact, the world would arguably have become a better place had Zoroastrianism (the world's FIRST major monotheistic religion) been the go-to Faith…and the Persians had come to rule Europe.}

{12 This was barring two notable things: circumcision and "halal" dietary restrictions. The Mongols saw the former as genital mutilation (and thus immoral), so disallowed it. Mongols saw the latter ("halal" food services in the marketplace) as discriminatory against non-Muslim food proprietors; which it was. Thus their bone of contention with such practices was one of basic justice; it was not an attempt to oppress.}

{13 After the waning of intellectual activity in Baghdad, some isolated cases persisted in the Ummah–primarily in Andalusia. Recall that in southern Iberia in particular (a.k.a. Andalusia; i.e. the western frontier of the Muslim world), intellectual activity had flourished during Islam's Pyrite Age. In the 10th century, Muhammad ibn Mu'adh al-Jayyani and Abu al-Qasim Khalaf ibn al-Abbas al-Zahrawi (a.k.a. "Albucasis") appeared in Cordoba. In the 11th century, Abu Ishaq Ibrahim ibn Yahya al-Naqqash al-Zarqalluh (a.k.a. "Al-Zarqali") appeared in Toledo. And in the 12th century, Ibn Rushd (a.k.a. "Averroës") appeared in Cordoba…while Abu Bakr ibn Tufayl appeared in Granada. During the 12th century in Seville, there appeared Abu Muhammad Jabir ibn Aflah, Abu Muhammad Abd al-Haqq al?Ghafiqi al?Ishbili, and Abu Marwan ibn Zuhr (a.k.a. "Avenzoar").}

{14 This is especially so with what was dubbed "kalam": Greek philosophy. In its worst tradition, it was simply a euphemism for Islamic theology. In its best tradition, it referred to the willingness to subject the Koran to critical scrutiny.}

{15 In modern times, the rubric "Arabic numerals" caught on–eliding the actual history of the numeric system. For other examples of onomastic snafus, see "French fries", "Danish" pastries, Chinese "fortune cookies", "Swedish meatballs", and "Russian" salad dressing. Both the French horn and the English horn have German origins. We should keep this in mind the next time we hear someone cavil about "cultural appropriation". In the meantime, don't expect any French kissing after going Dutch on a Swedish massage.}

{16 The great thinker, Omar ibn Ibrahim al-Khayyam was also from Khorasan; but he lived in the early 12th century, prior to Temujin's birth. In fact, during Islam's "Golden Age", MANY great thinkers hailed from Persia / Bactria / Khorasan–as the list of Muslim luminaries listed in this essay attests. Many of these thinkers worked in Baghdad during its heyday.}

{17 I say GENUINE "ijtihad" as opposed to the ERSATZ "ijtihad" sometimes touted by religious fundamentalists; specifically the Ayatollahs in Iran.}

{18 Anyone familiar with Tengri-ism TODAY knows that there is nothing–nor has there ever been

anything–remotely evangelical about the Faith. Pursuant to the Mongols' encounter of Dar al-Islam, the evangelism was entirely uni-directional. This is made obvious by the fact that virtually NOBODY–let alone large swaths of the population–in the newly conquered lands converted to Tengri-ism. Rather than Muslims converting to the (monotheistic) Faith of their conquerers, they persuaded their conquers to leave the Mongol Faith and adopt the Mohammedan brand of monotheism. This is rather unprecedented. In other words: The (Tengri-ist) Mongols were SO open to other religions that they were quite easily converted to a potpourri of Faiths–Buddhism, Taoism, Syriac / Nestorian Christianity, Manichaeism, and–of course–the most evangelistic religion of them all: Islam. All religions were not only TOLERATED under Mongol rule, but even FACILITATED–as all religious leaders were exempt from taxation and public service. Rather than razing the sacred structures of foreign Faiths, Mongol rulers often funded their CONSTRUCTION (as an act of good will). Ögedei Khan had houses of worship built for Hindus, Buddhists, Taoists, Manichaeans, Christians, AND Muslims. Both Chagatai Khan and Hulagu Khan had Nestorian cathedrals erected. In fact, Chagatai Khan was known for his religious tolerance, allowing the building of mosques throughout his realm. This is attested in the "Tarikh-i Rashidi" by "Beg" Mirza Muhammad Haidar of the Dughlat in Kashmir.}

{19 Sometimes, the 9th-century Persian polymath, Abu al-Abbas of Nishapur / Khorasan [alt. dubbed "Iranshahr"; hence "Abu al-Abbas Iranshahri") is mentioned. However, he was not explicitly Muslim (he was largely influenced by Zurvanism); and actually considered HIMSELF a prophet. (He claimed to have received a divine revelation from the angel, "Hasti".) We might also note that, since history is written by the victors, any great thinkers who ended up eschewing Islam were likely expunged from the official record–as was the case with the 9th-century freethinker, Ibn al-Rawandi of Khorasan. During Islam's Pyrite Age, there were various thinkers of dubious significance. Here are twenty. First, four from the 9th century:

- Arab "Mutazili" expositor, Abu Uthman Amr ibn Bahr al-Kinani of Basra (a.k.a. "Al-Jihaz"), who penned an adaptation of Aristotle's "Book of Animals". He is best-known for his anthology of satirical stories: the "Kitab al-Bukhala" [Book of Misers].
- Persian "astronomer", Abu Ma'shar of Balkh (a.k.a. "Albumasar"), an employee of the Abbasid court who's primary vocation was astrology (rather than astronomy).
- Persian mathematician / astronomer, Abu Abd'ullah Muhammad ibn Isa of Mahan / Kerman (a.k.a. "Al-Mahani")
- Persian mathematician / astronomer, Ahmad ibn Abd'ullah Habash Hasib Marwazi of Merv / Khorasan

Next, ten from the 10th century:

- Egyptian (Fatimid) "astronomer", Ibn Yunus of Fustat, who's primary vocation was astrology. He was most known for his "Kitab Bulugh al-Umniyya".
- Palestinian herbalist, Muhammad ibn Sa'id al-Tamimi of Jerusalem. He is often considered a "physician"; however all he did was concoct theriac remedies; and so did not advance medical knowledge in any significant way.
- Persian polymath, Abu Zayd Ahmed ibn Sahl of Balkh, who dabbled in psychology.
- Persian physician, Al-Natili of Tabaristan, who translated "De Materia Medika" (by the 1st-century Greek physician, Pedanius Dioscorides) into Classical Arabic.
- Persian geometer / physicist, Abu Sahl Wayjan ibn Rustam of Kuh [Tabaristan] (a.k.a. "Al-Quhi"), who worked for the amir, Sharaf al-Dawla in Baghdad.
- Persian instrument-maker, Abu Hamid Ahmed ibn Mohammed of Saghan / Hormozgan was known for refining astrolabes in Baghdad.
- Persian mathematician / astronomer, Abu'l-Abbas al-Fadl ibn Hatim of Nayriz / Fars

- Persian mathematician / astronomer, Abu Sa'id al-Dharir of Jurjan / Astrabad (a.k.a. "Gorgani")
- Persian mathematician / astronomer, Abu'l-Hasan Kushyar ibn Labban of Gilan / Khwarezm
- Persian mathematician / astronomer, Abu Jafar al-Khazin of Khorasan

Finally, six from after c. 1000:

- 11th-century Persian mathematician / astronomer, Abu Nasr Mansur [ibn Ali ibn Iraq] of Gilan / Khwarezm
- 11th-century Andalusian polymath, Maslama al-Majriti of Cordoba, who's main concerns were alchemy, astrology, and magic (ref. the "Rutbat al-Hakim" and "Ghayat al-Hakim"). His other major achievement was translating Ptolemy's (geocentric) "Planispherium" and "Almagest".
- 11th-century Andalusian polymath, Abu Muhammad Ali ibn Ahmad [ibn Said ibn Hazm] of Cordoba; who was little more than a conservative Islamic apologist (who masqueraded as a scholar). He promoted the "Zahiri" (literalist) interpretation of scripture.
- 12th-century Persian (Hanbali) jurist, Abdul-Qadir of Gilan
- 13th-century Andalusian (Sufi) mystics, Ibn Arabi [a.k.a. "Shaykh Al-Akbar"] and Ibn Sab'in of Murcia

While oft-talked about, such men did not contribute anything significant to the advancement of human knowledge. For an account of the iconic Islamic thinkers who were NOT estimable, see part one of my essay on the history of Salafism. There, I list a prominent figures who are erroneously accorded high esteem by many Islamic apologists–sometimes even by ostensibly "liberal" Islamic polemicists. For further comment, see footnote 27 below.}

{20 Plato's academy was razed by the Roman General, Lucius Cornelius Sulla in the early 1st century B.C.–not because he was a religious fanatic, but because he was a hyper-militaristic sociopath (infatuated with wreaking havoc on the conquered). In other words, it was Sulla's megalomania, not a concern for destroying heretical books, that drove him to sack Athens. By contrast, India's magisterial "Mahaviharas" at Nalanda and at Vikramshila were both destroyed by Islamic conquerers for explicitly religious reasons. Gratuitous destruction has many motives. It is important to distinguish between them.}

{21 The theologian, Ibn Taymiyyah said something very telling to Mahmud Ghazan (who was Muslim) about Hulagu (who was not Muslim). Comparing their respective treatments of Damascus, he noted: "You claim that you are Muslim and you have with you mu'addhin, muftis, imams, and shaykhs; but you invaded us for what? While your father and your grandfather, Hulagu, were NON-Muslims, they did NOT attack; and they kept their promise. Yet you [a fellow Muslim] broke your promise." This position prompted Ibn Taymiyyah to issue his notorious fatwa calling for jihad against fellow Muslims (that is: those who contravened sharia), thereby invoking the "takfiri" precedent. Even more revealing is how he rationalized the excommunication of the (Sunni) Il-khanate. It was not because they were killing civilians. Rather, his bone to pick with them was religious: He contended that the Il-Khanate was still hewing too much to the Mongolian "Yassa" civic codes (rather than abiding by strict sharia).}

{22 The famed (Sassanid) academy at Gundishapur was the preeminent medical school in the Middle East during MoM's lifetime. It was the methods established there that would be emulated centuries later at Baghdad's "Bayt al-Hikma". To reiterate: The primary function of the "Bayt al-Hikma" was poaching ideas from other cultures' stockpiles of intellectual achievements. As it so happened, the academy was shuddered once the Mohammedans conquered the region–hardly a sign that scholarship (read: science) was prized.}

{23 The academy at Sura had a subsidiary at Pum-Nahara. The academy at Pum-bedita was moved to

Mahuza (later rendered “Mada’in”) in the 4th century.}

{24 This does not count the myriad “vihara” (monasteries) where monks simply studied Buddhism–as with Bukrampur, Manyakheta, Nagarjunakonda, Odantapur, Ratnagiri (Odisha), and Shalban (Bengal); as well as Sunethra-devi, Vidyalankara, and Vidyo-daya Pirivenas.}

{25 These literary schools yielded such prominent writers as Chernorizets Hrabar, Joan Ekzarh, and Constantine of Preslav; as well as Naum and Clement of Ohrid (all in the late 9th century). This was around the time the “Recitations” were being converted into CA script from the original Kufic script. It is also when the earliest hadith were being compiled.}

{26 A noteworthy factoid: There is currently a fundamentalist Shiite organization named the Islamic “Dar al-Hikmah” [Islamic “House of Wisdom”] in the United States (Dearborn Heights, Michigan), which serves as a Shia indoctrination facility. As it turns out, the meaning of “hikmah” is in the eye of the beholder.}

{27 Three more deliberate omissions (due to lack of qualification). **First:** Shortly after 1600, the Safavid (Shia) illumination-ist, Sadr al-Din Muhammad of Shiraz / Fars (a.k.a. “Mulla Sadra”) made a name for himself as an “Ishraqi” (practitioner of a mysticism-infused Islamic theosophy, sometimes referred to as “al-hikmah al-muta’liyah”). This is hardly an estimable intellectual feat. (It might be noted that Mulla Sadra was one of Grand Ayatollah Khomeini’s favorite expositors.) **Second:** Sultan Suleyman “The Magnificent” does not qualify as a stalwart either, as he was not a great thinker; and in fact was a brutal military conqueror who executed his own son for displeasing him. **Third:** I abstain from listing 9th-century Muslim astronomer Al-Farghani, as he was a Ptolemist (in keeping with the errant cosmological model of the Koran); as well as 18th-century Naqshbandi (Sufi) “muhaddith”, “Shah” Wali’ullah Dehlawi, as he was a Hanafi fundamentalist who’s purported “reforms” were either insignificant or non-Progressive. Note that, in speculating that the Earth was spherical (something that was already long-known elsewhere), Al-Farghani actually defied the Koran. In other words, insofar as he got something correct, it was because he departed from his holy book’s flat-Earth depiction. In any case, Eratosthenes of Cyrene had already not only established that the Earth was spherical, but managed to calculate its circumference to within a few kilometers. That was in the 3rd century B.C.}

{28 There are countless case-studies of this infelicitous phenomenon. One of the most notable was the short-lived Augustinian school of the “Victorines” in the 12th century. Founded in 1108 in a Parisian suburb, the school thrived for 65 years. Its demise came when (Christian) Reactionaries seized it. Being doctrinal Roman Catholics, they were vehemently anti-intellectual; and exhibited chronic derision for anything resembling secular thought. So in 1173, the pedagogical spirit of the school was decisively curtailed, and it was rendered a more conventional abbey. The programmatic suppression of intellectual activity in Europe by the Roman Catholic Church began in Late Antiquity–as with the execution of Hypatia of Alexandria in 415, followed by the execution of Boëthius in 524. Also note that the greatest intellectual–and pedagogue–of the 12th century, Peter Abelard, was a heterodox thinker who was persecuted for heresy. That would be followed by the condemnations of 1277; the excommunication of William of Ockham in 1328; the execution of Jan Hus in 1415; Grand Inquisitor, Tomas de Torquemada’s reign of terror in the 1480’s and 90’s; the burning of Michael Servetus in 1553; the burning of Giordano Bruno in 1600; the persecution of Galileo in 1633; the imprisonment of Denis Diderot in 1749; etc. etc. etc.}

{29 For an excellent history of advances in mathematics, see Peter Beckmann’s “A History of Pi”. For a history of advances in the sciences generally, Timothy Ferris’ “Coming of Age In The Milky Way” is a wonderful summation.}

{30 Al-Haytham is well-known for the quote: “The duty of a man who investigates the writings of scientists, if learning the truth is his goal, is to make himself an adversary of all that he reads; and…attack it from every side. He should also suspect HIMSELF as he performs the critical examination of it, so that he may avoid falling into either prejudice or leniency.” Contrast this approach to that of, say, Al-Ghazali (see footnote 3 above).}

{31 The fetishism of Classical Arabic is like any other lingual fetishism in that it involves delusion. (Note, for example, that fundamentalist Jews still think that Classical Hebrew was the original language of mankind; and is thus “god’s language”. Indeed, lingual fetishism usually takes the form of a liturgical language.) When one is inclined to designate a language as somehow divine, one is forced to claim its eternality (as it can’t be merely man-made). One is therefore compelled to countenance absurdities.}

{32 Note that the best source we have of what really occurred is Ata-Malek Juvayni’s “Tarikh-i Jahangushay-i Juvaini” [History of the World Conqueror]. It is quite possible that Juvayni, having qualms with the Nizaris, would have had all Isma’ili material in the library destroyed. Such destruction would have been delimited; and done at the direction of a MUSLIM, not by the Mongols.}

{33 Note that I do not include men who were known primarily for promulgating dogmas (i.e. religious polemicists and apologists)–as with Abu Nu’aym of Isfahan: the Buwayhid muhaddith who promoted Ash’ari theology (with a touch of Sufi mysticism) in the late 10th / early 11th century. Nor do I include the likes of, say, Abu al-Rahman ibn Ali ibn Muhammad Abu al-Farash al-Jawzi of Baghdad (a Hanbali preacher from the 12th century), who are often passed off as “scholars”.}

{34 Though purportedly established in the 8th century, the “Zitouna” madrasah in Tunis did not become an institution of higher learning until modern times. The only institution that may have emulated “higher learning” established within the Ummah during the “Golden Age” was a Shia madrasah–founded at Fez, in Morocco (c. 859) by a Berber woman named Fatima al-Fihri. A Shiite from Kairouin, Tunisia, she named the madrasah “Al-Qarawiyyin” after her hometown. The madrasah was commissioned under the aegis of the (Zaydi) Idrisid Dynasty; and eventually received university status in 1963. Ironically, it is now Sunni.}

{35 Thabit ibn Qurra of Harran (al-Jazira) was not a Muslim, though he flourished in the Islamic Golden Age during the Abbasid Dynasty (9th century). He is described as a “Sabian”, which can mean several different things. (He may have worshipped the moon-god, “Sin” or may have been a “Mandaean”. Either way, he would have spoken Syriac.) Though born in Harran (al-Sham), he lived most of his life in Baghdad. He was a renown mathematician / scientist who pioneered physics.}

{36 It is apropos that one of the only gay-friendly mosques in the world is named after Averroës: the Rushd-Goethe masjid in Germany. This Progressive mosque is an apt tribute to one of the great Progressive Muslims of history.}

{37 He was the student of noted Andalusian polymath, Ibn Bajja of Zaragoza (a.k.a. “Avempace”); and was best-known for his “Philosophus Autodidactus”.}

{38 Centuries later, Ismail al-Jazari of Diyarbakir became a renown (Turkic) engineer employed by the Artuqids. He was best known for his compendium, “The Book of Knowledge of Ingenious Mechanical Devices” (early 13th century). The work included enhancements of the designs by the aforementioned Banu Musa brothers (spec. the water-clock). Al-Jazari may have been responsible for the invention of the cam shaft. However, such work pales when compared to the works of the Florentine thinker, Leonardo da Vinci in the next century; or even when compared to Hero of Alexandria, who lived twelve centuries

earlier. In any case, such achievements can in no way be attributed to religious fervor; as no relevant insights were gleaned from doctrine. (It should go without saying that the Sunnah did not inform Al-Jazari's design ideas.) It was the acuity–and dexterity–of his own mind that can be thanked for any knack for invention he may have enjoyed. This is yet another illustration of the "in spite of" vs. "because of" distinction (vis a vis religiosity).}

{39 Al-Razi was primarily known for his work in Baghdad as a physician–reminding us that many aspiring intellectuals were drawn to the so-called "House of Wisdom" at the time. (Note: He is not to be confused with the 12th-century theologian, Fakhr ud-Din of Rey, also referred to as "Al-Razi"; as "al-Razi" simply means "from Rey".) Al-Razi was a champion of Reason and an anti-literalist. He boldly claimed that Faith without Reason had no value. Alas, he adopted Galen's theory of the humors–though later recanted this position in his notebooks (collected as "Al-Hawi"). For much of his career, he indulged in alchemistic balderdash. His contributions were minor and sporadic–mostly having to do with procedural issues. (It is possible he innovated soap; though he knew nothing of bacteria.) Needless to say, none of his worthwhile contributions came from the Sunnah.}

{40 Egyptian "Sheikh", Mohammed Abduh (d. 1905) was what might be called a Kafka-esque Salafi, in that he–paradoxically–proffered a "Progressivism" by harking back to the Salaf. In his mind, the Golden Age of Islam ended because people stopped being "Islamic" ENOUGH. Therefore, his thinking went, if only the Ummah went back to ways of the Salaf, it could somehow PROGRESS. The idea was that the Muslim world stagnated because Muslims became too "soft" (i.e. insufficiently pious; too libertine). He thereby inverted what would have been the accurate diagnosis. This trope has become commonplace in Islamic apologia: The heyday of Islam could be resurrected IF ONLY Muslims would more strictly hew to the Sunnah. They are languishing not due to their religiosity, but because they are not being sufficiently pious. Their panacea lay in becoming more religious. Thus forwards is backwards and backwards is forwards.}

{41 He was a pioneer of algebra and geometry, esp. with his treatise, "The Demonstration Of The Problems Of Algebra". He was also a philosopher, and arguably the first major humanist in the Muslim world. It is arguable that he was not even genuinely Muslim. Indeed, he was regularly castigated for being a skeptic / freethinker; and was even banished from the Seljuk court. His poetry had a quasi-Sufi ethos, yet it palpably anti-religious.}

{42 Not to be confused with his mentor's teacher, Sharaf al-Din of Tus.}

{43 Any religious affiliation of great thinkers in Europe to Roman Catholicism was due ENTIRELY to the world into which they were born (where religiosity was de rigueur, and oftentimes compulsory). It was NOT due to any conscious decision any of them made to (proactively) join the church–that is: for doctrinal reasons. Michele de Montaigne's contributions to thought certainly had nothing to do with the Vatican…any more than did those of Augustine-Louis Cauchy, Leonard Euler, or G.E.M. Anscombe. While Gregor Mendel was affiliated with an Austrian Abbey, we can be quite certain that his association with clergy had nothing to do with his discoveries. In sum: We would not chalk the insights of these quasi-Catholic thinkers up to some chimerical dedication to the catechism. So why would we chalk the insights of the quasi-Muslim luminaries listed here up to some conjectured adherence to the Sunnah?}

{44 When explaining how the European Dark Ages began in the first place, the 10th-century Arab historian, Al-Masudi made the astute observation: "Ancient Greeks and Romans had allowed the sciences to flourish. Then they adopted Christianity. In doing so, they effaced the signs of learning, eliminated its traces, and destroyed its paths of inquiry." Science was eclipsed by institutionalized dogmatism. Little did Al-Masudi know, the same thing would happen to Dar al-Islam; and for analogous reasons.}

{45 To be fair, Al-Masudi shot his own (Mutazili) cause in the foot. In his fervor to promulgate his more rationalist version of Islam, he used draconian measures–commissioning a kind of Inquisition to enforce his decrees. Predictably, such a drastic, heavy-handed approach caused resentment; thereby sowing the seeds for the demise of Mutazilism.}

{46 Centuries later, Shiite fundamentalists (read: Iran's Ayatollahs) would contort the meaning of "ijtihad" to suit their own deranged purposes. In a bizarre Orwellian inversion, they labeled their own Reactionary thinking a kind of "ijtihad".}

{47 The attempt by Islamic apologists to demonize the pre-Islamic Mongols for their military aggression is especially ironic; as the Mongols used the same approach as had been used by their own prophet: submit or perish.}

{48 Genghis Khan established the precedent: Always, give a city the opportunity to submit to Mongol rule before attacking. The Mongols were not automatically inclined to kill ANYONE; they simply employed draconian tactics when expanding their domain. Their concern was political dominion…which did not in any way involve an agenda to kill a people based on ethnic identity. The two most egregious cases of overmuch killing at the hands of the Mongols were committed in 1221. One was by Genghis himself: the sacking of Old Urgench…though most of the descriptions of the slaughter are likely exaggerated, or even apocryphal. (Within a few generations, the city was burgeoning, and undergoing a revitalization known throughout the world.) The other was by Genghis' son, Tolui, who sacked the Greco-Persian city of Merv. In that attack, the casualties were–admittedly–stratospheric. The city soon thereafter fell under the rule of the Il-khanate (the regime founded by Tolui's son, Hulagu). The Il-Khanate would not become Islamic until 1295 (under Hulagu's great-grandson, Ghazan, who converted from Buddhism at the behest of the Oirat emir, Nawruz–who was a notorious Muslim zealot). It was not until 1789, though, that Merv was razed. That was done by the Sunni militants from the Emirate of Bukhara–who either massacred or banished the city's Shiite population…FOR RELIGIOUS REASONS.}

{49 Brian Catlos' "Kingdoms of Faith" is a good book on the interaction between Catholics and Muslims in medieval Andalusia.}

{50 Pursuant to the Index Librorum Prohibitorum, the Catholic Church banned "Oration On The Dignity Of Man" by the Italian humanist, Giovanni Pico della Mirandola in the late 15th century. It then banned the works of Francis Bacon and the Dutch Humanist Hugo Grotius in the 17th century. After that, book-banning went into full throttle during the Enlightenment: Pascal's "Pensées", Michel of Montaigne's "Essays", Locke's "An Essay Concerning Human Understanding", as well as EVERYTHING by Hume, Voltaire, and Rousseau. Most telling was the banning of Kant's "Critique Of Pure Reason"–a book that threatened nobody but, well, those who despised pure reason. The church even banned Diderot's great encyclopedia. The banning went on through Mill, Marx, and Darwin…and into the 20th century.}

{51 What makes the Koran dangerous is that it passes itself off as the most insightful book in human history. Not only does it get most things wrong; it–quite literally–gets nothing right (morally, scientifically, or historically).}

{52 It might be noted that, in the 19th century, more scientific journals were published in German than in all the world's other languages combined. (Social sciences like economics, sociology, and anthropology were primarily British and French.) To this day, less scholarly material is published in Arabic, Farsi, Pashto, Punjabi, Bangla, and Indonesian "bahasa" (of whom there are over a billion native speakers) any given year than is published in German (less than 100 million native speakers) any given fortnight.}

{53 Though established by the (Isma'ili) Fatimids as a Shiite madrasah in Cairo (c. 972), Al-Azhar did not achieve university status until 1961, and is–not without significant irony–now considered the home-base for Sunni thought. As with the aforementioned "Al-Qarawiyyin" at Fez (Morocco), such madrasahs were more SEMINARIES than institutions of higher learning–as with the Christian "Didascalium" (a.k.a. "Catechetical School") of Alexandria, active during the 2nd and 3rd centuries (the legacy of which is now claimed by the Coptic theological seminary in Cairo). Another point of comparison would be the Christian "school of Antioch", active from the late 2nd to early 5th century. NEITHER of those institutions would be considered a bona fide university by today's standards; and for the same reasons. Meanwhile, the Iranian "Nizamiyya" system of the 11th century (named after the Seljuk vizier, Nizam al-Mulk) was primarily established as a theological bulwark to combat the growing Isma'ili (Shia) influence in Persia–yet another glaring irony, as Iran is now a Shia theocracy. The network's most famous instructor was the Salafi fanatic, Al-Ghazali (see part 1 of my essay, "The History Of Salafism"). During Islam's "Golden Age", NONE of these could be accurately called "universities"; and none were comparable to the schools at Nalanda and Vikramshila in India. Moreover, none of them would come close to what the universities at Bologna and Oxford would become in the 11th century. The criteria for "university" and "higher education" must be consistent if we are to draw comparisons across cultures.}

{54 The fact that, over the course of more than twelve centuries, throughout the entire Muslim world (almost a third of the world's population for much of that period), only three dozen figures are worth mentioning attests to the larger point. Is 36 men of letters an impressive tabulation? Was their tenure really indicative of intellectual efflorescence? Rather than engaging in flights of fancy in the service to specious apologetics, we must keep their (limited) achievements in perspective. Juxtapose any of them to Renaissance thinkers like, say, Descartes or Bacon or Copernicus or Spinoza or Locke or Newton or Leibniz, and the proper perspective may be established.}

{55 The Assyrians invented aqueducts in the 8th century B.C. for the city of Nineveh. Evidence for the technology during Late Antiquity exists at Hampi in Karnataka; as well as in the Nabataean ruins at Petra. The Etruscans were the first to design water channels in the Occident (as with the "cuniculi" at Veii, used for irrigation, drainage, and to supply potable water).}

APPENDIX 1:

Juxtapose the Muslim figures who's thinking has most benefited mankind with the roster of odious Muslims who's thinking has done the world the most harm. Here are ten:

- Abu Hamid Muhammad ibn Muhammad al-Ghazali of Tus (hyper-dogmatic, vehemently anti-intellectual, Persian theologian from the late 11th / early 12th century)
- Ibn al-Salah (fanatical sheikh of the Shafi'i school in the late 12th / early 13th century; inspiration for Salafism)
- Ahmad ibn Taymiyyah of Rum [a.k.a. "Sheik ul-Islam"] (Hanbali fanatic in the late 13th / early 14th century; inspiration for both Salafism and Wahhabism)
- Muhammad ibn Abd al-Wahhab of Najd [a.k.a. "Ibn Abdul Wahhab"] (Arabian mullah in the 18th century; founder of Wahhabism)
- Sayyid Qutb (Egyptian polemicist; post-hoc inspiration for the theology of the Muslim Brotherhood)
- Sayyid Abul Ala Maududi (Pakistani icon of Deobandi militancy; inspiration for the Taliban)
- Abu Mohammed al-Maqdisi (Utaybah Hanbali theologian)
- Ibn Qayyim al-Jawziyyah of Damascus (Syrian Hanbali theologian)
- Muhammad abd al-Salam Faraj (Egyptian spiritual leader of "Tanzim al-Jihad")

- Ayman Mohammed Rabie al-Zawahiri (Egyptian spiritual leader of “The Base”; a.k.a. “Al-Qaida”)

This is, of course, a small sample set of fundamentalists. But it’s enough to illustrate the present point. (For more on the major impresarios of Salafism, see my two-part series.) In each case, we might pose the following query: What is the key difference between this man and any of the world’s progressive Muslims?

Note the juxtaposition represented by two brothers in the early 20th century: Hassan al-Banna (founder of the Muslim Brotherhood) and Gamal al-Banna (a liberal Islamic scholar). These siblings offer an illustrative juxtaposition of how versions of a Faith can diverge from one another under the same aegis: Islam.

Happily, there have been other instances of this kind of (iconoclastic / heterodox) Muslim figure. Such anomalies have occurred intermittently throughout Islamic history. Since the demise of the Ottoman Empire, numerous exemplars of secularized Islam have shown that Reform is tenable in the modern era. The ten most notable Muslim reformers of the 20th century:

- Indian reformer, Syed Ahmed Khan (d. 1898)
- Egyptian lawyer and women’s rights activist, Qasim Amin (d. 1908)
- Lebanese American feminist, Afifa Karam (d. 1924)
- Turkish statesman, Mustafa Kemal Atatürk (d. 1938)
- Kurdish scholar, Abu Bakr Effendi of Arbil (d. 1942)
- Iranian reformer, Ahmad Kasravi (d. 1946)
- Indian (Ismaili) statesman, Muhammad Shah Aga Khan III (d. 1957)
- Pashtun pacifist, “Bacha” Khan Abdul Ghaffar Khan (d. 1988)
- Lebanese statesman, Rashid Karami (d. 1988)
- Egyptian statesman, Farag Foda (d. 1992)

There have been other minor figures.

Note that Mohammed Abduh (d. 1905) is difficult to categorize, as he was a chameleon. That is to say, he was many different things to many different people–morphing into whatever happened to suit his purposes at the time: a Sunni, a Shiite, a Sufi mystic, a Freemason, a pagan occultist, an atheist…an imperialist lackey for the British, an ANTI-imperialist advocating for Arab nationalists… He was a maestro at redefining himself as needed–modifying his rhetoric as the occasion warranted. His entire life was an ideological kaleidoscope.

Most disconcertingly, Mohammed Abduh was an acolyte of the Salafi ideologue, Jamal ad-Din “Al-Afghani”. To discern his true colors, one might reference the Salafi boilerplate that Abduh used in his short-lived Islamic periodical, “The Indissoluble Bond”. As it turns out, even as he paid lip-service to Reform, science, and modernity (for pragmatic reasons), he envisioned a global (pan-Islamic) caliphate. *

{ Yet upon reading the Wikipedia entry on him, one would be left with the impression that Abduh was a resolute Progressive. (Zoinks!) This is yet another reminder that Wikipedia is often a dubious source when it comes to ideologically-charged topics. After all, how much should one expect from a site that consistently allows the North Korean regime (a totalitarian theocracy; Juche) to be labeled “communist” and the theocratic ethno-State of Israel to be labeled a “democracy”?}*

APPENDIX 2:

If we were to argue that “Bayt al-Hikma” was emblematic of the so-called “Golden Age” of Islam, we

would be forced to ignore two facts.

First: As we've seen, it was a rather unique phenomenon in the Muslim world–isolated both temporally and geographically.

Second: It was not a unique phenomenon in the world-at-large. We might note the educational institutions elsewhere in the world during the relevant period (c. 800 to c. 1300). To name 42 (in order of founding):

- The Sammatiya "migadaya" at Isipatana [Sarnath] (India)
- The (Kushan / Buddhist) schools at Gandhara and Mathura (Bactria)
- The "daneshgah" [academy] at Gondishapur (Persia)
- The "Sarough" [alt. "Sarouyeh"; library] at Isfahan (Persia)
- The Neo-Platonist school at Apamea (Syria)
- The Nestorian schools at Edessa, then at Nisibis (Syria)
- The Pandidakterion [i.e. University of the Palace Hall of Magnaura] at Constantinople (Byzantium)
- The (Carolingian) Urbs Regale at Aachen (Germany)
- The imperial (Tang) "Small Wild Goose Pagoda" at Chang'an (China)
- The maha-viharas at Pushpa-giri [Odisha / Orissa in Utkala], Uddanda-pura [alt. "Odantapuri"], Telhara, Vikram-shila, Kuruk-shetra, Taxsha-shila [alt. "Taxila"], and Nalanda in Bihar (India)
- The maha-vihara at Vallabhi in Saurashtra [Gujarat] (India)
- The maha-vihara, "Somapura" at Pahar-pur[a] (Bengal)
- The Preslav literary school; later the Ohrid literary school (Bulgaria)
- The medical school at Salerno ["Medica Salernitana"] (Italy)
- Bologna (Italy)
- Oxford (England)
- Parma (Italy)
- Salerno (Italy)
- Paris [alt. "La Sorbonne"] (France)
- Modena & Reggio Emilia (Italy)
- Cambridge (England)
- Salamanca (Spain)
- Padua (Italy)
- Naples (Italy)
- Vercelli (Italy)
- Toulouse (France)
- Montpellier [primarily known for its law and medical schools] (France)
- Studium Senese at Siena (Italy)
- Valladolid (Spain)
- Murcia (Spain)
- The Mongolian school of astronomy and medicine at Tabriz (Persia)
- Lleida (Spain)
- Alcala de Henares (Spain)
- The school of astronomy and mathematics at Kerala (India)

By the 8th century, the Byzantine Pandidakterion in Constantinople had become defunct pursuant to the Muslim conquests. Founded c. 425, it had been a school of medicine, philosophy, and law. Alas, along with most of the Indian maha-viharas, it would be razed by those who insisted that any non-Muslim activity needed to be eradicated.

By the 10th century, the Benedictine monastery at Cluny (France) was a center of civic activity, and served

as one of the great storehouses of Europe's ancient manuscripts. The institution started admitting female students in the 11th century. By 1100, Peter Abelard had established a school at Melun (then at Corbeil) in France.

By the 14th century (the first century of the Ottoman Empire), "Bayt al-Hikma" had been long defunct. At this time, the only active center of learning in the Muslim world was in the Malian Empire under Mansa Musa–specifically in Timbuktu, where he had commissioned the Djinguereber and Sankore masjids (which served as madrasahs). The University of Al-Karaouine in Fez, Morocco may have continued to serve as a madrasah as well; though it is difficult to ascertain exactly what sort of "education" may have been occurring within its walls.

Even then, the great Kannada pedagogue, Madhava of Sangamagrama founded a major school of astronomy and mathematics at Kerala, where major works in astronomy (Jyestha-deva's "Yuktibhasa") and even precursors to calculus (Nilakantha Somayaji's "Tantra-samgraha") would be composed.

Meanwhile the following major universities were founded over the course of the 14th century:

- The Guo-zijian [Imperial Academy] at Bei-jing (China)
- La Sapienza at Roma, Macerata, Perugia, Florence, Camerino, Pisa, Pavia, Lucca, and Ferrara (Italy)
- Avignon, Orleans, Cahors, Perpignan, and Angers (France)
- Coimbra (Portugal)
- Huesca (Spain)
- Heidelberg, Cologne, and Erfurt (Germany)
- Vienna (Austria)
- Charles at Prague (Bohemia)
- Jagiellonian (Poland)
- Pecs (Hungary)

By the time the Renaissance went into full swing, institutions of higher learning were opening throughout Europe. During the 15th century alone, major universities were founded in:

- St. Andrews, Glasgow, and King's College at Aberdeen (Scotland)
- Leipzig, Rostock, Greifswald, Freiburg, Ingolstadt / Munich, Trier[s], Tübingen, and Mainz (Germany)
- Leuven [Louvain] (Belgium)
- Lund and Copenhagen (Denmark)
- Uppsala (Sweden)
- Aix-en-Provence, Dole, Poitiers, Caen, Bordeaux, Valence, Nantes, and Bourges (France)
- Basel (Switzerland)
- Barcelona, Zaragoza, Siguenza, Valencia, and the Balearic Islands (Spain)
- Turin[o], Catania [Sicily], and Genoa (Italy)

Notable was the (neo-Platonist) Florentine Academy, which spurred an efflorescence in humanist thought in the 15th century–as demonstrated by its esteemed alumni, Marsilio Ficino and Giovanni Pico della Mirandola.

Thereafter (during the 16th and 17th centuries), university-foundings across Europe went into overdrive. I count over SEVENTY more major European universities established during that time–24 in Germany-Austria alone. * In addition, there were over a dozen others established in the European colonies in the "New World" (listed below). Meanwhile, major scholarly activity in the Ottoman Empire was dormant–as

the Muslim world languished in a sort of religion-induced intellectual torpor.

Also during the 1500's, the Bibliotheca Palatina was established at the University of Heidelberg and the Biblioteca Medicea Laurenziana was established in Florence. At this time, pace what little might have remained of the "dar al-kutub" at the Nizamiyah in Baghdad, there were no major libraries in the Muslim world. **

Regarding the 16th and 17th centuries (i.e. the time leading up to the Enlightenment): We might note that there was no equivalent to Michel de Montaigne or Nicholas Copernicus or Rene Descartes or Francis Bacon or Baruch Spinoza or Justus Lipsius or John Locke or Isaac Newton or Gottfried von Leibniz or Leonardo Da Vinci anywhere in the Muslim world. The (already stark) juxtaposition between Dar al-Kufr and Dar al-Islam was further magnified pursuant to the Enlightenment.

DURING the Enlightenment, if we were to survey Dar al-Islam, there could not be found any equivalent of a Daniel Bernoulli, David Hume, Denis Diderot, the Marquis de Condorcet, Charles-Louis de Secondat [a.k.a. "Montesquieu"], François-Marie Arouet [a.k.a. "Voltaire"], Jean-Jacques Rousseau, Adam Smith, Immanuel Kant, or Thomas Paine.

In sum: Pursuant to the Dark Ages, while intellectual activity in the non-Muslim world was burgeoning, the Muslim world (namely, the Ottoman Empire) was languishing. It's safe to assume that while Ottoman Sultan Selim III was attempting–and failing–to enact reforms, not many people within his vast empire were reading Kant's ***Critique of Pure Reason*** or Paine's ***Rights of Man***.

During the 16th and 17th centuries, several universities were founded overseas in European colonies–notably:

- Universidad Nacional Mayor de San Marcos (at Lima) and San Antonio Abad in Peru
- Thomas Aquinas at Santo Domingo in Hispaniola [Dominican Republic]
- Benemerita Universidad Autonoma at Puebla and the Royal / Pontifical University in Mexico
- Thomas Aquinas, Pontifical Xavier, and the College of Mayor de Nuestra Señora del Rosario in Columbia
- Francis Xavier in Bolivia
- San Carlos in Guatemala
- Laval in French Canada
- Harvard as well as William & Mary in the British colonies of North America
- Santo T[h]omas in the Philippines

In other words, during the High Renaissance, intellectual activity flourished more in Europe's colonies overseas than in the heart of the Muslim world.

{ During the 16th and 17th centuries, the following major universities were founded in Germany-Austria: Wittenberg, Viadrina, Marburg, Strasbourg, Königsberg, Dillingen, Jena, Helmstedt, Altdorf, Wurzburg, Graz, Giessen, Bremen, Hamburg, Paderborn, Rinteln, Salzberg, Bamberg, Duisburg, Kiel, Innsbruck, Halle, and the Prussian Academy of Sciences. (The University at Fribourg was Swiss.) The University at Gottingen was founded in 1734; Erlangen-Nuremberg in 1742; Münster in 1780. Jena in particular was arguably the preeminent University during the Enlightenment. More intellectual activity likely occurred within its walls than transpired throughout the entire Muslim world.}*

*{** Some libraries were established in the Balkans and Anatolia during the reign of Murad II (in the 15th century). During the reign of Mehmed II (r. 1451-1481), Bayezid II (r. 1481-1512), Selim I (r. 1512-1520) and Süleyman the Magnificent (r. 1520-1566), palace libraries were kept at Edirne and Istanbul.}*

APPENDIX 3:

Debunking Other Myths About The Mongols

During the late Middle Ages, there emerged a slew of tall tales designed to denigrate the Mongols. Let's look at four of the most outlandish.

ONE: Genghis destroyed the network of "kariz" (irrigation canals) in Persia. False. Determined to vilify Genghis, revisionist historians told tales about the "qanat" (the Arabic term for the canals) being filled in with sand during the Mongol invasions. This makes no sense, as the Mongols were aficionados of technology; and eagerly appropriated any new technology they encountered. As testament to this, the famed network of canals at Turpan remained entirely in tact after the Mongol conquest. Common sense also belies this cockamamie bit of apocrypha. The amount of work that would have been required to accomplish such a (pointless) task would have been Sisyphean; an idiotic allocation of time and energy.

Any destruction wrought during Mongol sieges was done to send a message (a warning to others who might resist); and occurred during the course of battle. This is something that the elimination of vital public works would not have accomplished. In any case, the Mongols COVETED infrastructure, so would not have been moved to deprive a newly-acquired municipality of such a useful resource (irrigation) sheerly out of spite.

TWO: Genghis destroyed the libraries at Balkh. False. This makes no sense, as the Mongols actively encouraged the dissemination of books; and were trailblazers when it came to literacy. In 997, the Ghaznavids (under Mahmud of Ghazni) overtook the city from the Samanids. It was then overtaken by the Seljuks in 1059. That was followed by the Kara-Khitans and Kara-Khanids. It was then ruled by the Khwarazmian shahs and Kartid sultans…both of whom the Mongols allowed to remain in power (as vassals). Clearly, the citizenry was not wiped out. By the time Marco Polo visited the city c. 1300, he described Balkh as (STILL) a great center of learning. When Ibn Battuta visited the city c. 1333, he described the city as sparsely inhabited, yet with its great universities still standing–replete with beautiful inscriptions in lapis paint. It was Tamerlane who razed the city–replete with its libraries AND citadel–in 1389.

THREE: Genghis slaughtering hundreds of thousands at Nisha-pur and Herat c. 1221. False. Such accounts are wildly exaggerated; and can be traced to the Islamic hagiographer, Ata-Malek of Juvayn of Khorasan, who was known for outrageous assertions and virulent anti-Mongolian bias. Juvayni routinely used comically-inflated numbers to describe events. Obviously, there were not even close to that many people residing in such cities.

FOUR: The Mongols would promise city-dwellers that nobody would be harmed if they surrendered. Then–after the city's leaders would surrender–they would slaughter everyone anyway, just to be cruel. False. This is actually the OPPOSITE of the surrender-or-perish policy for which the Mongols were known. They always gave a city the choice to surrender; and ONLY attacked when the overture was rebuffed (typically, after numerous warnings). An eminently practical people, the Mongols were certainly not afraid to fight; but they preferred NOT TO fight–that is: if violence could be avoided. Always frugal

with their limited resources, they avoided casualties in their own ranks whenever they could; so were not looking for a lethal confrontation if it was not necessary.

Barring the razing of [Old] Urgench, nearly all the cities that surrendered without resistance received relatively good treatment. Ironically, it was a concern for casualties in FUTURE campaigns that prompted Ghengis' worst excesses earlier on. So sustaining large numbers of dead and wounded when besieging a city meant they would take a terrible revenge when the city finally fell. The fiercer the resistance, the greater the carnage wrought. Again: This was to send a message so as to AVERT such eventualities going forward.

This myth is told mostly about the siege of Merv under Tolui Khan (grandson of Genghis and father of Hulagu) in 1221. As it turns out, such an account primarily comes from Juvayni.

We also encounter such confabulation regarding the siege of Kiev; yet the city was not sacked until the end of 1240 (thirteen years after Genghis died). It occurred during Batu Khan's campaign through Kieven Rus (Ruthenia / Galicia / Volhynia), which began with the sacking of Ryazan three years earlier. It was the military general, Möngke (brother of Hulagu), who led the attack…AFTER he'd offered the city the usual terms of surrender. Möngke's overture was not only rebuffed by the city's leader (the pompous voivode under King Danylo: Dmytro); his envoys were killed when they'd been sent to offer such terms. THAT is what prompted the extreme Mongol response.

Unlike the (utterly gratuitous) violence seen under Tamerlane generations later, the destruction wrought by the Tengri-ist / Buddhist Mongols was not indiscriminate; it was calculated. Genghis Kahn was deliberately conspicuous with his use of violence, and strategic with how he deployed it; as it was seen as PR. He ordered the slaughter of large numbers of people in certain places under certain circumstances, to set an example so that others would be more apt to submit without a fight. The strategy worked.

As Peter Frankopan put it: "In return for unstinting support, the leader provided goods, booty and status. Genghis Khan's genius was to be able to supply these benefits prodigiously enough to guaranteed loyalty–and to do so with metronomic regularity" (The Silk Roads, p. 155). Frankopan may have noted that the exact same statement could just as well have been made about most other conquerers–from Alexander the Great to Mohammed of Mecca. Frankopan added: "In fact, the Mongol's success lay not in indiscriminate brutality, but in their willingness to compromise and cooperate" (p. 173).

During the early 13th century, the Mongols sacked numerous cities across Asia–including Otrar (in 1219), Samarkand, Bukhara, and Balkh (in 1220) as well as [Old] Urgench, Nisha-pur, Herat, and Merv (in 1221).* Tellingly, most of these cities underwent a REVITALIZATION pursuant to Mongol seizure. When people WERE slaughtered by the Mongols, it was never for ideological purposes; it was always to set an example.

Mongols sometimes ordered the skulls of the slain to be gathered and put into massive piles–a task that had no purpose other than to send a message to those who would consider resistance in the future. In other words: It was a draconian way to deter casualties going forward. To reiterate: The primary reason for slaughter was to dissuade other cities from fighting when they were offered terms of surrender.

Predictably, demonization of the Mongols soon became a vocation in Dar al-Islam; and continues to be so to the present day. Menacing caricatures circulated around the world, portraying them as savages–sometimes as centaurs, sometimes with the heads of wolves, sometimes as demons. This is all, of course, risible balderdash.

The Mongols were, in reality, highly sophisticated and pioneers of cosmopolitanism. They used cutting-edge technology in battle; and invested heavily in public infrastructure after seizing a city. In valuing pluralism, they allowed for complete freedom of religion.

If one lived in an urban center during the Middle Ages, residing in any of the multi-cultural, well-managed municipalities of the Mongolian realm was probably one of the best options…UNLIKE medieval Europe, which was under the theocratic boot of the Roman Catholic Church (where one most likely lived in squalor, as a serf, with nil civil liberties). In recognizing the merits of cosmopolitanism, the Mongols did not abide serfdom, and guaranteed freedom of religion. For more on this, see my essay: "The Universality Of Morality".

So why the slanted record? Of the unflattering portrayals of the Mongols, Frankopan explains: "This slanted view of the past provides a notable lesson in how useful it is for leaders who have a view to posterity to patronize historians who write sympathetically of their age of empire–something Mongols conspicuously failed to do" (p. 157). It's the victors who write the official record. More to the point: Rulers who are determined to propound a vaunted legacy will commission chroniclers who will tout THEM whilst disparaging their adversaries. Hence what comes to be the prevailing version of "history".

The problem is that much of the information we now have about the Mongol conquests comes from highly biased sources–most notably: the "Tarikh-i Jahangushay" ["History of the World Conquerer"]…which was written by…Juvayni.

Alas, people often end up believing what they very much prefer to believe; which is typically what it is CONVENIENT for them to believe. After all, most farce is self-ingratiating; and propaganda is invariably self-serving (with respect to those who are promulgating it).

Funny enough, the disingenuous characterization of the Mongols is even espoused by esteemed historians like Frankopan. After having portrayed the Arab conquests as hallmarks of tolerance and "concord" earlier in "The Silk Road", he portrays the Mongol conquests as "the road to hell." If we are to believe Frankopan, Mohammedan hegemony was characterized by tempered civility; whereas Genghis' hegemony was characterized by unadulterated barbarism. In the opening passages on the Mongols, he echoes the usual tropes: They were "living like animals", behaving like savages, and all the other derogatory caricatures with which we have become all-too-familiar. **

To reiterate: The Mongol conquests humiliated the Muslim world. It comes as no surprise, then, that there was seething resentment that lingered for centuries; and consequently made its way into sanctified Islamic lore. In the advent of the Mongol conquests, Muslim expositors fumed about divine punishment and the end of the world. Writing about the Mongol "hordes" in luridly apocalyptic terms, they became unscrupulous propagandists more than evenhanded chroniclers. They weren't so much impartial historians as they were propounders of sanctified lore.

In assaying these disingenuous–nay, downright erroneous–accounts, we should always note that almost all of them came from those who had an ax to grind. The only chronicle that WAS made by the Mongols, "The Secret History Of The Mongols", was destroyed by the Soviets under Stalin. The sole redaction that survived was discovered by the Kazan monk, Pyotr Ivanovich Kafarov in 1872.

The point, then, is that many popular tales of Mongol atrocities were wildly exaggerated by their enemies and critics. This is most flagrantly so when it came to Islamic historiographers–who, needless to say, had a staunch, vested interest in demonizing those who had humiliated them. Ironically, the Mongols themselves

were more than happy to play along with this propaganda, as the terrifying accounts made opponents more likely to surrender without a fight. (You want to spread rumors of a single Mongol warrior slaughtering a million civilians with each wave of his sword, so be it! Free publicity.)

Note that three European sources are used for most accounts of the Mongols–each of which has highly questionable credence:

- A fanciful historiography by Giovanni of Perugia ["Pian del Carpine"] (a.k.a. "Carpini"): The "Hystoria Mongalorum"
- A fanciful ethnography by Franciscan emissary, "C" of Bridia: The "Hystoria Tatarorum"
- A fanciful historiography by Christian authors that came to be known as the Galician-Volynian Chronicle (the oldest manuscript of which is the Hypatian Codex from the late 15th century)

The hair-raising accounts of Carpini were popular in medieval Europe. He told of hooved creatures with the heads of dogs lurking at the frontiers of the Mongol homeland. (Gadzooks!) Meanwhile, "C" told of monstrous races; which were described as dog-faced, ox-footed savages. (Gadzooks!) He even wrote about Gog and Magog (lifted from the Alexander Romance) as well as the magnetic island of Tataros (lifted from tales of Sinbad the Sailor)…indicating that his accounts were based largely on (hand-picked) ancient fables that were popular at the time. Then, of course, there was the "Tarikh-i Jahangushay" by Juvayni. Before long, people were speaking of Mongols as demonic creatures (half horse, half men) that came from the edge of the world, bringing the apocalypse in their wake.

All made for a captivating narrative. The majority of it was sensational balderdash.

For a more scrupulous portrayal, I recommend the following modern sources:

- "The Empire Of The Steppes: A History of Central Asia" by Rene Grousset
- "Empires of the Silk Road" by Christopher Beckwith
- "The History of The Mongol Conquests" by J.J. Saunders
- "Genghis Khan And The Making of the Modern World" by Jack Weatherford
- "Genghis Khan: Life, Death, And Resurrection" by John Man

Other worthwhile–though less scholarly–books include Frank McLynn's "Genghis Khan: His Conquests, His Empire, His Legacy" and Richard Foltz's "Religions Of The Silk Road". Other than the slap-dash treatment of Genghis Khan and Tamerlane, Peter Frankopan's "The Silk Roads" is an excellent resource. For more on the ACTUAL deeds–and achievements–of the Mongols, see my essay on "The Universality Of Morality", where I dispel other misconceptions.

{ It should be noted that Tamerlane did far more damage to many of these cities–especially Balkh and [Old] Urgench. Frankopan notes: "While it is difficult to be precise about the scale of death inflicted in the [Mongol] attacks, it is worth noting that many (though not all) of the towns apparently overcome by waves of attackers recovered quickly–suggesting that the later [Muslim] Persian historians on whom we [tend to] rely may have been keen to over-emphasize the devastating effects of the Mongol attacks." That said, he allows that "even if [said historians] magnified the suffering, there could be no doubt that the winds that blew violence from the east did so with tremendous force" (p. 158). As it turns out, in his exposition, Frankopan HIMSELF makes use of highly biased accounts of Genghis–including Juvayni's "History of the World Conquerer".}*

*{** Frankopan offers a caveat to his own unflattering portrayal. "It was a pattern repeated time and again: money poured into towns that were rebuilt and re-energized; with particular attention paid to championing the arts, crafts, and production. Blanket images of the Mongols as barbaric destroyers are wide off the mark. [Such accounts] represent the misleading legacies of the histories written later [mostly by Muslims], which emphasized ruin and devastation above all else." Frankopan mentions this*

before–ironically–reverting to the uncharitable caricature HIMSELF, opining that the Mongols were "bringing the apocalypse". Eeesh.}