Islam and Science-1

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Introduction: the question

"Can Islam be reconciled with science?" This question was raised by the *Guardian*, London.[1] The question was *not* about reconciling Christianity or "religion" with science; it was specifically aimed at Islam. The *Guardian* clarified that this question arose from another: why is the Islamic world lagging behind the West in science? There might be a host of reasons for this, so the full question really was this: have some aspects of Islamic belief systematically retarded the growth of science in the Islamic world?

The first answer by Riazat Butt, of the *Guardian*, suggested that Muslims were simply in a state of denial: "I heard Muslim scientists and academics say that... there was no contradiction between their religious identity and their day job. One did not exclude the other because the two were kept separate. It got a little depressing, not to mention wearing, to hear over and over how the two were not incompatible..."[2]

The second response,[3] entitled "Islam's arrested development", was by Pervez Hoodbhoy, a Pakistani physicist, and author of a book on Islam and science. Hoodbhoy correctly demanded the right to question. However, he went further, and said that despite a good start, science did not take off in Islam because of reasons connected to Islamic theology: "To do science, it is first necessary to accept **the key premises underlying science** – **causality** and the absence of divine intervention in physical processes, and **a belief in the existence of physical law.**" [Emphasis added.]

The third response was by Britain-based Usama Hussain,[4] a Cambridge trained astronomer, and also an Imam. He squarely pinned the blame on al Ghazali for denying causality. He said this was a key factor responsible for the decline of science in Islam.

This issue—why does Islam continue to lag behind in science?— became prominent at a recent conference on hegemony. The discussion suggested it is little understood. So, it seems appropriate to restate my response[5] that Hoodbhoy had blundered:

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1 http://www.guardian.co.uk/commentisfree/belief/2009/nov/23/religion-islam
2 http://www.guardian.co.uk/commentisfree/belief/2009/nov/23/religion-islam-science
3 http://www.guardian.co.uk/commentisfree/belief/2009/nov/25/islam-science-muslims-religion
4 http://www.guardian.co.uk/commentisfree/belief/2009/nov/27/islam-science-ghazali
5 http://ckraju.net/blog/?p=40 .

what he calls the key premises of *science* are actually the key premises of (post-Crusade) Christian *theology*!

Before explaining *my* response, let us first understand what the *Guardian* respondents are saying.

Al Ghazali was a key Islamic theologian of the 12th c., who represents the current orthodox view. In his book, *Tahafut al Falasafa*[6] ("Incoherence of the Philosophers"), he argued against the Islamic philosophers and their doctrine of cause. The Islamic philosophers, like Ibn Sina (Avicenna), were typically also medical doctors in the tradition of Jundishapur. (Indeed, the word *hakim* means both a wise man and a medical doctor.) They thought that to treat an ailment one must understand its cause. Al Ghazali's argument was against an extreme form of this doctrine. If *everything* has a cause there is no room for Allah to do anything.

Al Ghazali's arguments are *not* illogical[7] (he wrote a book on logic, and allowed that even Allah was bound by logic); in fact they are unanswerable. In Islamic thought it is believed that Allah creates the world afresh at each instant. Al Ghazali said Allah creates smoke with fire as a matter of habit. He is not obliged to do so. That is, from the past observations that smoke occurs with fire, we can only infer that it is *likely* that fire will be followed by smoke; induction is *not* certain. Those trained in Western philosophy will recognize this as the unanswerability of Hume's objections. (Hume's arguments are copied from al Ghazali, but like all racists, he did not acknowledge his source.) Cause can only be established by induction (despite Popper[8]), so causes can never be certain. Al Ghazali's opponent, Ibn Rushd (Averroes), highly rated by Westerners, ranted and raved against him, but could not give any substantive argument; *hence* the *Guardian* respondent could do no better than quote some polemics from him.

Causality

Before getting further into these theological issues, let us first view the matter from the perspective of science. Why is causality necessary for physics? To give a scientific

6 Al Ghazali, *Tahafut al-Falasifa*, trans. S. A. Kamali, Pakistan Philosophical Congress, Lahore, 1958.

7 In fact, as a logician, al Ghazali drew a distinction between *logical* necessity and *causal* necessity, exactly the distinction used today to discriminate between the *logical refutability* of a scientific theory, and its *empirical refutability*. So, what al Ghazali said was that it is not *logically* necessary for cotton in contact with fire to burn; even though we have always observed this to happen, we can *conceive* that it may not happen. For a more detailed exposition of al Ghazali's arguments, in this vein, using Western terminology, see C. K. Raju, *The Eleven Pictures of Time,* Sage, 2003, pp. 222 et seq.

8 In his *Postscript to Logic of Scientific Discovery*, Popper incorrectly claimed to have solved the problem of induction by using Kolmogorov probability. See, C. K. Raju, "Probability in Ancient India", *Handbook of the Philosophy of Science*, vol 7: *Philosophy of Statistics*, Elsevier, Amsterdam, 2010, pp. 1171-91.

answer to this question we first need at least two scientific theories: one which is causal and one which is not. We need to test both theories to be able to say which one is better. To this end, of testing "causality", this author long ago formulated a new way to do physics by dropping just the assumption of causality from current physics. This amounts to accepting a small "tilt in the arrow of time".[9]

This physics was described in a book which was called *Time: Towards a Consistent Theory* for the following reason. Scientific knowledge is valuable because it is tested by experiments. This supposes that we freely conceive of possibilities, and perform any needed experiment to test between them. But what if the "laws of physics" had already determined, at the time of the big bang, say, that a certain key experiment could never be performed? Is it reasonable to claim on the one hand that scientific knowledge is validated by experiment, but on the other that it was decided long ago what experiments can be performed?

The typical response of a Western trained scientist/philosopher would be to confound this issue by relating it to numerous obscure Christian theological discussions of determinism vs "free will". Those discussions often aimed to maintain status quo by confounding issues, for example, by suggesting that "fatalism" differs from "determinism". This quibble is quite irrelevant to non-Christians.

If we stick to physics, *the issue actually concerns beliefs about time.*

Of two-timing scientists

The scientist has *two* beliefs about time. The first ("mundane time") is the everyday belief that *our* actions decide the future in some small way. *Every* action of our life is based on this belief. For example, consider the injunctions "study hard to do well in your exams", "be careful while crossing the road", "save for a more secure future", etc. Each such mundane maxim enjoins us to *do* something *to bring about a desired future*. The tacit assumption is that the future is *not* already decided by the remote past, but depends, in some small way, upon what *we* do. We may not be able to change the world overnight, but we *can* decide whether or not to drink a glass of water. Since we observe and practise this every moment in everyday life, it would be thoroughly unscientific and unreasonable for any science to deny this. And indeed, the scientist, as human being, does nothing different in mundane life. The scientist,

9 C. K. Raju, *Time: Towards a Consistent Theory*, Kluwer Academic, Dordrecht, 1994. Dropping the assumption of causality, or accepting a "tilt in the arrow of time" changes the equations of physics to mixed-type functional differential equations.

as scientist, accepts mundane time also for the purposes of performing experiments, to test a scientific theory.

However, when the scientist switches to scientific *theory*, and writes down the equations of physics, he uses the symbol *t* for time and picturises it as a straight line. (On the orthodox mathematical understanding of calculus, this belief, that time is like the "real line", is essential even to be able to write down the differential equations of physics in a meaningful way.) I have called this belief "superlinear time". It implicitly denies the belief in mundane time (and merely lumping both incompatible views into one confused category of "linear" time does not resolve the incompatibility).

This belief in "superlinear" time dates back to Newton who formulated physics using the calculus imported from India.[10] Like Descartes, Newton failed to understand the Indian calculus. But, instead of rejecting it like Descartes, he tried to reconcile it with his cultural beliefs using his theory of fluxions. Hence, he required that time should "flow" smoothly (whatever that might mean). More intelligibly, Newton thought there is no *physical* way to measure equal intervals of time, but that such a way was known to God. Hence, in his *Principia* he emphasized that time was *metaphysical* (rightly known *only* to God) by saying that time is "absolute, true, mathematical", and "flows on without relation to anything external". Newton used four adjectives to emphasize that time must be metaphysical. Making time metaphysical was a serious mistake, and the precise reason why Newton's physics ultimately failed. However, that is another story.

For the moment, the point is that, for whatever historical or customary reasons, the scientist has *two* beliefs about time: mundane time (for everyday life and for experiments), and superlinear time (to write down the equations of physics). He switches with facility from one belief to the other as convenient. It gets a little depressing, not to mention wearing to hear the scientist say there is no conflict between the two. Simultaneously holding on to both incompatible beliefs invites incoherence. However, the Western scientist is unperturbed by this incoherence because it can easily be related to a long-established tradition of incoherence in Western Christian theology. However, living with such incoherent beliefs about time cannot be part of any true science.

10 C. K. Raju, *Cultural Foundations of Mathematics: the Nature of Mathematical Proof and the Transmission of the Calculus from India to Europe in the 16th c. CE*, Pearson Longman, 2007.

Non-causal physics

In my book, *Time: Towards a Consistent Theory,* I argued that this incoherence in present-day science can be resolved by *dropping* the assumption of causality. Without getting into the mathematics of it, it is clear that if causality fails, there must be some events that are "uncaused" and not determined by the entire past. More precisely, such events are "spontaneous" and creative (they would create order, or diminish entropy[11]). Thus, this theory allows us to model the most common aspect of everyday experience: namely that the future is *not* determined by the entire past, but is decided in a small way by *our* choices; this is something inexplicable and impossible on current physics (even taking into account all the hand-waving about chance, chaos, complexity[12] and quantum mechanics).

That is, not only is it wrong to call causality a "key principle of science", but we get a *better* science by dropping the assumption of causality, as in my theory. Why, then, blame al Ghazali for rejecting causality?

The trap of Western endorsement of science

Comparison with everyday experience is the simplest and most robust way to decide the validity of a scientific theory. This suggests we should go with mundane time, and reject causality. Unfortunately, today, the validity of a scientific theory is *not* decided by experiment or mundane observation. An experiment is not considered valuable unless it costs a billion dollars, or at least several million dollars (which makes it difficult to replicate). As professionals, physicists are often more concerned about their livelihood than about making physics consistent with everyday experience! Science, today, is a quest for funds, more than a quest for truth.

In fact, the truth of scientific theory (or, equivalently, its fundability) is today decided by appeal to authority. This reliance on authority is strongly encouraged by the present system of education, which *ensures* that most people are scientifically illiterate. (That includes most scientists who are forced to specialise, and so do not understand anything beyond their narrow field of specialisation.) People (both scientists and non-scientists) therefore judge the validity of a scientific theory not by applying their own mind to it, but by asking "where was it published?" "who has endorsed it?" etc. That is, scientific truth is today judged by the stickers of Western social approval attached to it; a theory without authoritative *Western* endorsement

11 C. K. Raju, "Time travel and the reality of spontaneity", Found. Phys., **36**(7) 2006, pp. 1099-1113.

12 For more details, see C. K. Raju, *The Eleven Pictures of Time* (Sage, 2003), chp. 6 "Broken Time: Chance, Chaos and Complexity".

is deemed to be a "crank" theory, or a "fringe" theory on the presumption that scientific truth is a monopoly of the West. Hence, all non-Western scientists are "cranks" unless they are subordinate to the West. (Naturally, no Western scientist seeks to be certified as a non-crank by a non-Westerner.)

Let me add that I am not saying this because my own theory lacks such approval. In fact, it has garnered ample social approval in the West. One reviewer noted[13] "Raju advocates... the abandonment of the concept of causality ….The bare concept that I have just summarised is exploited with subtlety and elegance by Raju". He went on to quote Bohm that "progress in science is usually made by *dropping* assumptions" to wit, the assumption of causality. Another reviewer called the book "an important contribution...authoritative and written with impeccable clarity...an excellent book and I highly recommend it."[14] Perhaps the best tribute came from supposedly *the* foremost mathematician in the West, who, at the fag end of his life, *persisted* in his claim to have independently rediscovered some of the ideas in my book![15]

My concern is with the extreme danger of using Western endorsement as the yardstick of valid science, for this turns non-Western scientists into beggars soliciting Western social approval. If Muslim countries, and post-colonial states generally, have failed in the matter of science, it is in this respect that they have relied excessively on the West to tell them the right way to do science. After having been deceived by the West for centuries, they have foolishly chosen to trust only the West as regards science. As I have argued elsewhere,[16] aping the West in science will *never* help them to catch up with the West; it is just a trick to ensure perpetual subordination instead.

*Causality is **not** a key premise of science*

To resume the discussion of Islam and science, irrespective of how we decide the validity of science, whether by experiment or by appeal to Western authority, there is no way "causality" can be regarded as a "key principle of science" as Hoodbhoy maintains. As a physicist he should have been aware of that. Why, then, does he make such an absurd claim against Islam?

Before answering this question, let us take up the other thing that Hoodbhoy calls the key premise of science: namely the "belief in the existence of physical laws".

13 J. F. Woodward, *Foundations of Physics* **26** (1996) pp. 1725–1730.
14 G. J. Klir, *Int. J. General Systems* **27** (1999) pp. 427–28.
15 M. Walker, "Retarded differential equations and quantum mechanics", *Notices of the American Mathematical Society*, **54** (4) (2007) p. 472.
16 C. K. Raju, "Ending Academic Imperialism: a Beginning", paper for the Intnl Seminar on Academic Imperialism, Tehran, at http://multiworldindia.org/wp-content/uploads/2010/05/Academic-imperialism-final.pdf. Also, short video of summary at http://www.youtube.com/watch?v=zdvgH4gByfk.

The “laws” of nature

Now, why should a scientist *believe* in physical “laws”? Science is (or ought to be) about knowledge, not belief. How do we *know* that such laws exist? Has science proved that nature has “laws”. Clearly the answer is no. Scientists do build models, but models, like opinions, are fallible, and acknowledged as such, unlike laws. So why does Hoodbhoy relate science to laws?

Now, the belief in “natural laws” is, today, a common sort of belief, for most (Western-educated) people are first introduced to science in school, through “Newton's laws”. What they are not told is that while there is *no* scientific reason to call them “laws” (especially since it is known for a century that Newtonian physics failed), there *are* theological reasons for believing in “laws of nature” in post-Crusade Christian theology.

Post-Crusade Christian theology

By way of background, one consequence of the Crusades and the conquest of Spain was the influx of knowledge into Christendom from the Arabic libraries of the former Caliphate of Cordoba, and especially the library of Toledo. But the Crusades failed militarily beyond Spain. Since the real objective of the Crusades was to try and bring Muslims under Christian control, the church now shopped around for ways to persuade Muslims to convert, without the use of force. Since, Muslims did not accept the authority of the Christian scriptures, reason was the sole remaining tool of persuasion. Hence, post-Crusade theology adopted reason (after modifying it).

Now, (post-Nicene) Christianity had earlier vehemently rejected reason; Christian priests attacked the philosophers, burnt their books and libraries, including the Great Library of Alexandria, lynched Hypatia, declared Proclus a heretic, and ultimately banned philosophy in the Roman empire. However, post-Crusade theology did an about-turn and accepted reason. This forced a major revision of Christian theology, often attributed to Aquinas.

Briefly, this Christian rational theology took off from the earlier Islamic rational theology or the *aql-i-kalam*. Hence, the debate between falsafa and al Ghazali in Islam was reflected in a similar debate in Christian theology. However, unlike Islam where the debate was settled in favour of al Ghazali, in Christian theology, the debate was settled in the opposite direction. John Duns and his followers, who championed “providential intervention”, came to be called dunces with all the negative connotations that the word has today.

Differences between Islamic and Christian theology: creation and immanence

The reasons why the debate was settled differently in the two cases were pointed out by me in an earlier article.[17] It is important to understand these reasons to resolve the confusion in the minds of the *Guardian* respondents.

Two key differences between Islamic and Christian theology are critical here. First, the notion of creation. Unlike Christianity where creation is a one-time affair, creation in Islam is a continuous process: Allah creates the world afresh at each instant. Hence, if the state of the world at this instant is entirely determined by its state at previous instants, then there is no room for Allah to create anything.

Second, unlike the current Christian tradition of a transcendent God (God outside man), al Ghazali, a sufi, believed in immanence (God inside man). This was a belief to which the Islamic philosophers also subscribed (so this was not part of his debate with them). One articulation of this belief in immanence is in the story of the sufi Abu Yazid (Bayazid). He went to meet God, and finding the throne empty sat down on it (to discover the God inside him). This is very similar to the *tat tvam asi* of the Upanishads (as noted by Dara Shukoh), and the falsafa ("Neoplatonists") had very similar beliefs, as is well known. The immanent God acts *through* man (and living beings in general: even Bollywood films understood this, as when a snake providentially bites the villain). That is, if the future state of the world is entirely determined by its past states, then there is no room for creative intervention by *humans* either. However, as we have already noted, the possibility of such creative intervention, to bring about a desired future, is a manifest fact of our everyday life, and also the basis of the very belief that science can be tested by experiment.

The politics of Christian theology

Why did Christian theology end up denying this manifest fact? Early Christianity accepted immanence: as Origen succinctly put it,[18] "God is all and *in* all". Post-Nicene Christianity (i.e., after the 4th c.) was, however, primarily anchored to the political concerns of the state, and the greed of Christian priests. Accordingly, it favoured a transcendent God, since, otherwise, there would be no need for the church. When this belief in a transcendent God was combined with the belief in reason, it led to various problems.

17 C. K. Raju, "Benedict's Maledicts", *Indian Journal of Secularism*, **10**(3) (2006) 79-90. Also, http://www.zcommunications.org/benedicts-maledicts-by-c-k-raju

18 Origen, *De Principiis*, II.3.7, http://www.newadvent.org/fathers/04122.htm.

For example, since the church viewed creation as a one-time event, it was now obliged to answer the question: what did God do after he created the world? Did he just sit idly by and watch all the evil playing out?

There were two answers to this question. First, that God intervened personally to sort things out, e.g. lightning striking church towers. The second was that, like a king, God ruled the world remotely with the help of laws— the laws of nature.

The theological problem, specific to Christianity, now was this: if God was (a) transcendent, (b) ruled the world with laws of nature, and (c) also made repeated providential interventions, then that made God *too* powerful. This damaged the doctrine of sin; if God intervened constantly, but yet did not prevent evil, why should man be blamed for it, and cast eternally in hell? However, the post-Nicene church had consistently used theology as a political means of mind control; the doctrine of sin had long been a useful instrument for it, for, by making people feel guilty about the simplest natural acts, it brought them under the control of the priest. To retain the "useful" doctrine of sin, Christian theology abandoned the belief in providential interventions. Typical of theology, this rejection was only partial, for the church continues to accept prayer, for example, as a means of invoking divine intervention.

Laws of God and laws of nature

Thus, the theological belief that came to prevail by Newton's time was that the Bible was the word of God, while nature was the work of God, governed by laws[19] written in the language of mathematics (which supposedly embodied eternal truths). In his private notes (which were suppressed, and emerged only in the 1970's) Newton cancelled the word "hypothesi" (hypothesis), and replaced it with the word "lex" (law). That is, he thought that he had discovered the laws of God. (Newton's belief that he was a prophet was furthered by his belief that he was born on 25 Dec. This belief was based on his belief in the defective Julian calendar, different from the Gregorian calendar then in use in Europe; however, that is yet another story.)

The belief in rational laws of God (nowadays euphemistically called "laws of nature") did not mean that the belief in providential intervention disappeared overnight. Newton, for example, believed that God did make providential interventions, but only rarely. Thus, Newton was unable to prove the stability of the solar system.

19 Thomas Aquinas, *Summa Theologica*, *First part of the Second Part*, 91,1, "a law is nothing else but a dictate of practical reason emanating from the ruler...the whole community of the universe is governed by Divine Reason. Wherefore the very Idea of the government of things in God the Ruler of the universe, has the nature of a law. And since the Divine Reason's conception of things is not subject to time but is eternal, according to Proverbs 8:23, therefore it is that this kind of law must be called eternal." http://www.newadvent.org/summa/2091.htm.

Therefore, he thought that the solar system required maintenance, and God restored its stability by means of an occasional intervention, in the manner of a clock-maker who occasionally winds the clock. So, the view in Newton's time was that God ruled the world with the help of natural laws, but also occasionally intervened.

However, Laplace was able to prove the stability of the solar system. Since Laplace was infamous for "borrowing" work from his younger colleagues, without acknowledgment, his student, Napoleon Bonaparte, twitted him, saying that he had written a book without once acknowledging God as creator. The ready-witted Laplace replied he had no need for God in his system (unlike Newton), for the solar system remained stable. This led to Laplacean determinism, where the cosmos is like a giant piece of clockwork, and God is the clockmaker, but the clock runs on its own, and needs no winding. Laplace imagined a creature who could tell the entire future of the world from exact knowledge of one instant in the past. Since Laplace denied the need for God, this creature came to be known as Laplace's Demon.[20] The demon also reduced humans to a piece of clockwork, and eliminated the possibility of any human creativity. Of course, this pompous claim fell along with Newtonian physics and *its* pompous claim to have discovered the laws of God.

Hawking, singularities and creation

The Western tradition of mixing theology with physics, continues to this day. Christian theology believed in one-time creation; therefore, it too had to allow God freedom to create the world at some time. So, the "laws of nature" could not be eternal but must break down at the "moment" of creation. This is exactly what Stephen Hawking claims to have proved—that the world begins and ends in "singularities", which supposedly are a "beginning" or "end" of time. At a singularity, Hawking claims, the "laws of physics" break down. The bottom line of his (scientific) book says: "the actual point of **creation**, the singularity, is outside the scope of the presently known laws of physics."[21] Hawking believes a singularity is "the actual point of creation", a true beginning of time, unlike the big bang, which may not be the moment of creation of the cosmos (for a big bang might be just the other side of a "big crunch" in which the previous cycle of the cosmos might have ended). In fact, this claim that science has proved the one-time creation required by Christian theology is incorrect: all that happens at these singularities, is that the Western

20 Laplace's demon is considered in more detail in my book *Eleven Pictures of Time*, in the place cited earlier.
21 S. W. Hawking and G. F. R. Ellis, *The Large Scale Structure of Spacetime* (Cambridge University Press, 1973, p. 364. Emphasis added.

calculus notion of derivative breaks down.[22] The supposed singularity can be easily overcome by doing calculus differently, and also by eliminating the theology in it.[23]

"God who?" said a front page advertisement brought out by the Discovery Channel the day Hawking lectured in Delhi. It went on to inform readers that "Hawking's efforts, according to him, are to understand the mind of God." So, after Newton, we have another prophet in Stephen Hawking! Curiously, both based their grand prophetic visions on a misunderstanding of the calculus! Interestingly, one of the *Guardian* respondents lists Stephen Hawking as one of his heroes; for Western education gives us numerous such heores in whom we must uncritically believe.

Summary and Conclusions

To summarise, belief in the "laws of nature" is a key premise of post-Crusade Christian *theology;* this is not even a scientific belief leave alone a "a key premise underlying science", as Hoodbhoy has called it. Likewise, the belief in (perfect) causality is a key aspect of the doctrine of sin, but science is better off without it. Scientific theories (like this author's theory) which reject causality already exist, and can better explain observed facts, so there is no reason to berate al Ghazali for having rejected causality.

Let us now take stock of the mischief played out by the *Guardian*. First, Muslims are being told that there is problem between Islam and science. Note again that what is being stated is not that there is a general issue between science and religion, but that there is a specific problem with Islam. This specific problem is identified with al Ghazali's rejection of causality, and the disbelief in "laws of nature". The remedy that is being suggested is that Muslims should ape the decisions of Christian theology (which decisions were taken for *its* political benefit). That is Muslims are being asked to turn into Christians to catch up with the West in science!

If we put this together with the de facto standard that the non-West must wait for a scientific theory to be approved by the West, irrespective of any empirical facts or theoretical arguments, then we have the recipe for perpetual domination by the West.

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22 For a non-technical account, see *The Eleven Pictures of Time*, chp. 3. For a technical account, from within formal mathematics, see, C. K. Raju, "Distributional Matter Tensors in Relativity", In: *Proceedings of the 5th Marcel Grossmann Meeting*, D. Blair and M. J. Buckingham (ed), R. Ruffini (series ed.), World Scientific, Singapore, 1989, pp. 421–23. Also, arxiv.org: 0804.1998.

23 This theology crept in through the notion of infinity, and the shift from the belief that mathematics incorporates "eternal" truths to the belief that it incorporates "universal" truth, but that is yet another story. For this problem of infinity from the non-Western philosophical perspective of zeroism, see C. K. Raju, *Cultural Foundations of Mathematics*, Pearson Longman, 2007, chp. 8 and Appendix.

This was exactly the recipe used by Macaulay to inject Western education in India, and stabilise colonial rule. The bait hung out was the same: that Western education would help Indians "catch up" with the West in science, and people like Raja Rammohun Roy swallowed it hook line and sinker. As a consequence, while the British merrily ruled India, with the help of Western educated Indians, India has yet to "catch up" despite centuries of blind imitation of the West.

Undoubtedly, a big section of the elite in colonised countries was bought out. And this bought-out elite is impervious to everything except its narrow self interest, which is tied to that of the West; and so it encourages the trickery with which the West has acquired its dominant status.

However, the disturbing new aspect of colonialism was hegemony, or mind-control. People asking us to ape the West often do so in all sincerity, like the *Guardian* respondents. The aim of Western education is to produce people who, like Christian priests, direct their critical faculties *only* towards non-Western cultures. So far as the West is concerned, they become so blindly uncritical that, like Hoodbhoy, even after having spent a lifetime teaching physics and reflecting on its relation to Islam, they cannot tell where science ends and Christian theology begins! They cannot really be so lacking in imagination, but, somehow or the other, the sole remedy they can ever think of is to ape the West. They persistently advocate this quack remedy despite its manifest and repeated failure in the past. The soft power of the West grows by inculcating Western norms in others through Western education. The *Guardian* respondents hence mistakenly proclaimed that the doctrines of Christian theology are so essential to science that Islam should adopt those doctrines to further the pursuit of science! In fact, getting rid of the Christian theology in science (and mathematics) leads to a far better science (and mathematics).

But isn't it a historical fact that science developed in the West? We will see more about that in the next installment.