

Draft 2

Swaraj in thought: Decolonising our universities for a just world order

C. K. Raju

*School of Mathematical Sciences
Universiti Sains Malaysia
11800 Penang¹*

Introduction

Political independence did not mark the end of colonisation, for colonial power had two facets. Physical occupation was one, while capture of the mind was another.² Capture of the mind was more important, for it enabled physical occupation by creating the domestic support for British rule. Without that domestic support, a handful of Britishers could hardly have ruled a vast country like India, lacking, as they then did, advanced technology of any sort. Political independence ended physical occupation, and diminished direct colonial control, but the mind control, like the evil spell cast by a sorcerer, continues to this day. Consequently, the former colonies have *uncritically* retained most foreign institutions including a constitution based on Platonic ideas of the Republic, a legal system and judiciary based on British aristocratic practices (“milord”, wigs, etc.) and common law; market “democracy”, and, most importantly, education based on the Western university model.

This uncritical acceptance of all things Western is certainly *not* the same as assimilation: in its more farcical aspects it extends to blind imitation of Western clothes—such as wearing a suit and tie in the Delhi summer—or of Western accents, as in air hostesses who think it the acme of fashion to speak Hindi with a British accent. Note that the same people would practically die of shame if caught speaking English with a desi accent. The matter is not restricted to flighty airhostesses; one of our great intellectuals preferred to be known not as Thakur but as its British mispronunciation: Tagore. There is no assimilation here, but only a marked feeling of inferiority. Because this feeling of inferiority is so widespread, it must have a systematic cause, which we need to ascertain. On the British side, this belief about their own superiority was reflected in the signs “Indians and dogs” not allowed, which signs we must not forget.³ This was the common practice in many colonised countries, for the colonisers thought they had trained the colonised in the manner of dogs. It won’t do just to condemn this as racism, for we need to *understand* the root cause of that racism. How could someone, with the intelligence of even a monkey, subscribe to that belief that the color of the skin was a mark of superiority or inferiority?

This paper argues that it is Western education that instills that feeling of inferiority on one side and racist superiority on the other. Though Macaulay didn’t explicitly say so, his aim obviously was to train some Indians as dogs who would be loyal to their masters, wag their tails and beg for crumbs, but who would bark at and even bite other “dogs”, especially those untamed and hostile to their masters. The paper goes on to describe some attempts to undo the ill effects of Western education, especially in the light of the recent Iran conference on “Academic Imperialism”, and the Penang conferences on “Hegemony” and on “Decolonising our Universities”, and the resistance to these attempts.

The causes of colonialism

To successfully decolonise, one needs to understand the real causes of colonialism. We have already seen that colonialism was not a simple physical occupation, but involved a capture of the mind.⁴ This was brought about by Western education, but it is inappropriate to solely blame one individual, Macaulay, for having introduced it. For, as I have repeatedly stressed, Macaulay could not have succeeded without the support of the local elite. Long before Macaulay, Rammohun Roy himself pleaded⁵ with the British Government to put money not into Sanskrit (and Arabic) schools, which then prevailed, but into institutions which would impart Western education. Macaulay too, in his infamous minute,⁶ stressed that half the people were already with him. We cannot undo what Macaulay did, without understanding and undoing the basis of that support for colonisation from the colonised elite. On the other hand, it would be a mistake to imagine that those reasons are static in time. Certainly, Western education, since Macaulay, has consolidated that support for colonisation from the colonised, so that it not only persists to this day, but has been greatly amplified. Let us, however, first understand the reasons for that initial support.

False history and the colonised elite

The original reasons were simple. Rammohun Roy was taken in by false Western history which glorified the West and belittled everyone else. (I have elsewhere⁷ carefully defined the term “West” in the context of Toynbee’s theory of history as the same old Orosian story of the triumph of Western Christianity, and the use of this history to formulate military strategy by post-Cold-War military strategists like Huntington.) Being excessively gullible, it did not strike Rammohun (or any Indian historian since) to cross check this history. This man who roared like the church against Hindu idols, which tell symbolic stories, became himself a meek idolist taken in by the church idols of Jesus (Iesu), plagiarised, like the story, from the Greek god Bacchus, a representation of the Egyptian Isis. Rammohun was gullible enough to believe that Jesus was a real historical person like Indian academics today who give dates in AD and BC and object only to the historicity of Rama but never of Jesus. Rammohun wrote a book and several pamphlets, addressed to Christians,⁸ to advertise what he thought were the admirable moral precepts of Jesus. Noticeably, he became a “Hindoo convert to Christianity”, as he is described in the preface to that book, and as is clear from his strong objection to being described as a “heathen” and not a “Christian”, in the resulting critique by missionaries.

Rammohun did not study history sufficiently to ask why Europeans, if they were intrinsically superior, were compelled to sit by impotently and impatiently for the 259 years between the arrival of Vasco da Gama (with the help of Malmi Kanha) and the battle of Plassey (won by bribery). That Europeans had long nurtured dreams of conquering India is clear from the failed 1580 attempt by Jesuits to do so by trying to convert the Moghul emperor Akbar—that attempt was tom-tommed in Rome as the classic church strategy of conquest through conversion by which the Roman empire itself was taken over, since Constantius II, son of Constantine.

Rammohun Roy (and Indian historians since then) lacked the scholarship to investigate and find out how the church had blessed and encouraged that distorted history since the 5th c. Orosius’ “History Against the Pagans”, which glorified Christians and relentlessly belittled all others—and twisted facts

to match. Rammohun (and Indian historians since then) failed to notice that in this Orosian tradition, down the centuries to Toynbee, Christian historians never *ever* had anything good to say about any non-Christians.⁹ Rammohun (and other Indian historians and scientists since then) did not suspect that the Western history of science might have been similarly concocted during the centuries of religious war (Crusades) and religious cleansing (Inquisition), with precisely the same idea of glorifying Christians and belittling everyone else.¹⁰ Therefore, like any ignorant and gullible neo-convert or semi-convert, Rammohun (and most other Indian academics, since then) fell a prey to that missionary propaganda, thinly disguised as secular history. Naturally, Westerners praised him for this, for he brought so many with him.

(However, it is worth noticing that, unlike present-day academics educated in the Western tradition, who never dare question anything Western, Ramamohun did so only to discover to his chagrin that while criticising Hindusim made him a reformer and a hero of modernity in the eyes of the West, even the mildest criticism of Christian superstitions like trinitarianism, or the belief in the triple godhead—the Father, the Son, and the Holy Ghost—led to his being described as an anti-Christian “controversialist” and denounced as a “heathen” on the grounds that superstitious belief in the Holy Ghost was essential to being called a Christian!) To reiterate, Rammohun was a man of strong convictions, right or wrong. So, even though he served the East India Company, he cannot be said to have had an eye on personal pecuniary advantages from British rule, the way the Indian civil servants of the Raj commonly did, or the way Indian academics today commonly write papers with an eye on potential foreign assignments, or the way managerial aspirants train for multinational jobs today. In any case, without denying the existence of those bribes, my submission is that all the bribes put together do not explain the hegemony that colonialism established, by sleight of hand. That Western sleight of hand has never ever been discussed by Indian academia; it is clearly a taboo. We need to break this taboo to understand that false Western history was essential to colonial hegemony.

False history and Western philosophers

This false history also relates to racism. The false history was exactly what was used by Christians like Kant¹¹ and Hume¹² to justify the racist belief in the superiority of white-skinned people. They “philosophized” that black and browns were inferior since history showed that they were incapable of any creative effort! Kant propounded the ethical precept that blacks must be “kept apart by thrashings”. Clearly, these so-called philosophers lacked both ethical sense and commonsense.

The origins of false Western history of science

The origin of this false Western history is not hard to understand: it arose directly due to church attempts to establish hegemony. As I have argued elsewhere, the false history of science was concocted in two key steps. During the Crusades, all Egyptian knowledge was appropriated to Greeks, together with all later-day world knowledge in the Arabic library at Toledo. Due to fears of the Inquisition, all foreign knowledge subsequently imported into Europe was claimed by Europeans as their own invention without acknowledging the foreign sources from which they stole. Later-day racist historians completed the task as has been so well pointed out by George James and Martin Bernal. Whatever was left to be done was finished off by colonial historians, and the Indian historians they so assiduously trained in their institutions like Cambridge, and counterparts in India.

Example: “Claudius Ptolemy” and the *Almagest*

An example might make matters clearer. Thus, the stock history of astronomy today mentions “Claudius Ptolemy”, and then moves on to Copernicus and his glorious heliocentric revolution. This history began during the Crusades, when the church wanted the knowledge in Arabic libraries, and did not know how to justify translations from the “heathen” with whom it was engaged in a religious war, and whose books it had hitherto burnt. The simple way out was a bald lie: all that knowledge was attributed to the Greeks.

In fact, the Greeks did not know elementary arithmetic, their numerical notation did not permit algorithms to multiply and divide, so they could hardly have done mathematical astronomy. Till the time of Plato the Greeks were such a terribly superstitious lot that they regarded astronomy as a crime to be punished with death. (As Plato’s *Apology* points out, this was the crime on grounds of which a death penalty was demanded of both Anaxagoras and Socrates.) Nevertheless, we are expected to believe that Claudius Ptolemy suddenly appeared with 13 decimal-place (7th sexagesimal-place) precision, acknowledging no predecessor except Hipparchus. The Greek astronomical tradition then disappeared with equal suddenness without a trace in the Greek and Roman calendars, which remained worthless as ever. That Greeks could never manage even the easier aspects of astronomy, like the length of the year, is clear from the non-textual evidence of their shabby calendars. While the Romans laughed at that calendar, and reformed it, the (“corrected”) Roman calendar was almost as awful, and the length of the year in it did not agree even with the *Almagest* length of the year (itself far inferior to the contemporary figure in India), despite repeated attempts at calendar reform. These reforms were necessitated, since the Council of Nicea, by the church attempts to fix the date of Easter correctly. Thus, the *Almagest* was obviously absent, at the supposed time of Claudius Ptolemy, and could not be located in the Roman empire for centuries, despite the entire might of the state. Hence the *Almagest* obviously comes from a later time.

In fact, the *Almagest* is clearly an accretive text (e.g. the current pole star heads its star list, so it is later than the 9th c. which is the earliest date the current pole star was the star closest to north). Such accretion is natural for any scientific text in practical use. The text started in Egyptian times (hence “Ptolemy”). It incorporated knowledge of Indian astronomy and arithmetic algorithms from both Jundishapur and Baghdad, followed by Persian and Arabic contributions to astronomy. All of this is attributed today to one fictitious superman Claudius Ptolemy for whose existence there is no evidence, who, as in a fairy tale, had no predecessors on whose work he built, and no practical reason for doing that sort of precise astronomy. The date of this fictitious Ptolemy is fixed by reference to four so-called observations. It is bad practice to use isolated passages from an accretive text to date it, but those passages are especially useless for the *Almagest*, for the so-called observations in it have clearly been back-calculated.¹³ As pointed out in my response to Witzel,¹⁴ Harvard historians (and their Indian allies) point out these bad practices only in the case of Indian history, never in the case of Greek history. Such double standards are the hallmark of racism, and they are needed to support the false history which comes to us from the church.

Example: Copernicus

Similarly, it has now been known for over half a century¹⁵ that Copernicus was a mere priest who transliterated (not merely translated, from Greek to Latin) the work of Ibn Shatir, a Greek translation of which was available in the Vatican library¹⁶ which Copernicus visited. Nevertheless, in support of the Kuhnian image of Copernicus as a revolutionary, who brought about a paradigm shift, Harvard historians still maintain that Copernicus could have made an “independent rediscovery”,¹⁷ like so many students addicted to copy-paste technology do today, or like Newton’s “independent rediscovery” of the calculus imported from India¹⁸ before he was born. In fact, there are so many other notorious “independent rediscoveries” by prominent Westerners down to the present-day.¹⁹ So, on the Kantian ethical precepts, it is the white-skinned Europeans who “must be kept apart by thrashings” for if they had any creative abilities in science, they would not have needed to lie so profusely about its history.

False history and Western education

Nevertheless, it was this sort of false history (“science is the work of Greeks followed by Europeans in the renaissance”) which led to the belief that science is all the work of the West. Hence, the demand for Western education, which is, at bottom, a demand for science and technology (and, of course, for good jobs). As I have argued in detail elsewhere,²⁰ the policy of Western education is still promoted with the same carrot of “catching up with the West”, in science and technology, despite the manifest long-term failure of this policy, and the empirical evidence that it leads only to permanent dog-like status.

At the time of Rammohun's initial intervention in 1823 it was false history alone, particularly the false history of science, which led to the belief in Western superiority, and the desire for Western education. The situation has naturally changed after nearly two centuries of Western education. The nature of this change was brought out forcefully in the reactions to the recent conference²¹ on decolonising our universities in Penang. The conference sought to critically re-examine Western education and explore alternatives.

How Western education limits thought

However, indoctrination through Western education so limits the imagination,²² that it blocks the search for alternatives, and regards the very thought as something sacrilegious. This captured imagination of the Western-educated mind instantly rejects all critiques of Western institutions, from non-Western sources, liberally using adjectives such as “illiberal”, “chauvinistic”, “nationalistic”, and “unreliable”. This effectively blocks out any thought or argument seriously critical of the West (unless mediated by Westerners themselves, who will naturally point in the wrong direction).

That this prejudice is indeed widespread was amply demonstrated by the public reactions²³ to the conference, which assumed a dichotomy: either one blindly accepts the West or one blindly rejects it. Therefore, this (or any other) critique of the West was repeatedly equated with blind rejection of the West, without ever once entering into details of the critique. Note that, unlike the Indian press which has largely ignored this issue of decolonising math, for the last four years,²⁴ a section of the Malaysian press and intelligentsia was very supportive of this issue of decolonisation.²⁵ Nevertheless, the public reactions show that a critique of the West, especially as regards science and maths,²⁶ is almost

completely beyond the imagination of the Western educated, who are taught that it is universal. This prejudiced rejection was not limited to the lay public and *repeatedly*²⁷ found its way even into editorial reports in the EPW.²⁸ Thus, the empirical fact is that the Western educated are so deeply prejudiced about the Western role in science and technology, that they are unwilling even to countenance a discussion of the evidence for it.

This is an added dimension that Rammohun Roy did not have to face. The false history by which he was taken in is today reinforced by Western education, which insulates it from any critique by the non-West, by means of a thick coating of prejudice. Like the missionary position, Western education teaches people not to pay heed to the evidence, but to go by the stories which have been authoritatively approved, like those of the immaculate conception of calculus or relativity. The Western educated are either unwilling or unable to consider any critique of the West or the evidence for it. Their first and second and third reaction is just to dismiss any and every critique from the non-West, without examining it, as arising from some bad motives. Their fourth, fifth, and sixth reaction is to ignore it and do nothing, along the lines of the church strategy of erasure of all critics. (We have seen examples of this for the last four years in India, and will see further examples of that a little later on.)

This is exactly as in matters of religion. People, once they form an opinion, pay little heed to any opposing sentiments or criticism, howsoever well founded. That is how the prejudices implanted in the Western educated are used to defend the West against any and all criticism.

Why Western education limits thoughts

Why does Western education make people so insular and parochial? The post-conference discussions²⁹ brought out some facts which explain this, but have never before been pointed out. The first is that the Western university began (in Bologna) during the Crusades as a handmaiden of the church. It remained that for many long centuries. For example, in the 17th c. Isaac Barrow, Newton's mentor and master of Trinity College, Cambridge, stated that the role of the college was “the breeding of clerics”, therefore, special dispensations to those graduates who sought to avoid being clerics ought to be avoided.³⁰ He clearly thought of Cambridge as a Christian madarsa, intended to produce priests who would go out in the world and do propaganda for the church.³¹ This certainly continued until the 19th century, and the umbilical connection has persisted until the 21st c, in many devious ways, as is clear from the documented experiences mentioned in my response.³² The Western university has traditionally played, and continues to play, a key role in church propaganda, and in producing propagandists. One must clearly understand here that the church domination of Europe was based primarily on “soft power”, so the practical value of this propaganda in producing power (and consequently wealth) for church priests should not be underestimated.

To be sure, the church no longer has the totally dominant status it had from the beginning of the Dark Ages and through the long centuries of the Crusades and the Inquisition. It has today agreed to share power with the state and capital.³³ Therefore, while the church implemented the Western education system that Macaulay planned, they produced clerks for the British Raj rather than clerics. (Note that Roman Catholic Jesuits, nominally opposed to the church of England, were equally prominent in this process, as in the Xavier colleges in Kolkata and Mumbai or the Loyola college in Chennai, which last was instrumental in ruining math education in India, through a secondary hegemony.³⁴)

Likewise, today, Western education aims to produce “business managers” also known as “engineers”, both of whom supply the *industrial* needs of cheap labour (rather than the *state* needs of cheap labour which the British empire had). However, the substance of the indoctrination remains much the same: to produce voluntary slaves by chaining minds. Western education still instills a deep seated belief in the superiority of the West and inferiority of the non-West, which make the Western-educated deeply reverential towards the West. What the business manager mostly learns is to dress like a Westerner (especially the tie), and to speak like a Westerner (especially English). The key value he learns is awe of the West and complete, slavish subordination to it, and his biggest dream is to get the job of a well-paid slave in a Western (“multinational”) company. Naturally, a person “educated” in this way cannot ever be critical of the West, for he regards it as his foremost duty to demonstrate his loyalty to the West by attacking the critics, without regard to the substance of the criticism, in the manner of loyal dogs.

Note that despite these changes at the level of higher education, the false church history of course remains part of the indoctrination of every Indian school child today. For example, as I have been pointing out since 2007, the class IX school text in math shows numerous racist pictures of Greeks, like “Euclid”, as white skinned. When asked for evidence, the authors of those text were unable to supply (primary) evidence that those figures who supposedly lived in Alexandria, in Africa, were white-skinned. They could not even supply evidence for the primary manuscripts on which those claims of “Greek” achievement were based. For example, what is the evidence that “Euclid” wrote the *Elements*? Or that “Euclid” even existed? The authors of the text could produce no hard evidence and just kept telling more stories or piling on hypotheses, exactly as Narlikar has done in his “scientific” work.³⁵ But NCERT supports them by asking *why* primary evidence is needed for history, and why secondary sources cannot be used, so long as they are Western!³⁶ To break this superstition, I have offered a prize of Rs 1.5 lakhs for serious evidence about Euclid. Needless to say, this prize, like Kovoov’s prize is going abegging, but our school texts stay unchanged. Clearly, these Christian superstitions are far more terrible than superstitious belief in astrology (like Kepler had), since the latter superstitions do not find their way into school texts.³⁷

What Western education teaches: reliance on Western authority

This, indeed, is the other key value implanted by Western education: the belief that (only) Western sources are reliable. That is the belief that *Western authority is the key means of validating knowledge*. This belief pertains not only to history, but also to science. That is, Indian academics and scientists think that Western approval is the key test of valid knowledge. Like the clerk’s blind trust in his bosses, this blind trust in Western social approval as the ultimate test of truth is a source of many maladies in the current educational system.

Because Western universities were, for centuries, oriented towards propaganda, Western education relentlessly drills home this one point: that only Western sources are reliable. This notion of “reliable source”, as tied to Western authority, is very actively used by Wikipedia, for this blind faith in the West is the key to the credibility of *all* other Western propaganda. Science too has been reduced to this superstitious blind faith in the West. Tell a scientist about a new theory and he will ask *where* it was published. Tell him it was published in *Nature* or that it originated in Harvard or Cambridge, and he will believe it. In other words, the validity of science is to be decided by authoritative social approval of Westerners, and *not* by applying one’s own mind. Note clearly that the issue is about trust, not peer review, for there are numerous other peer reviewed journals. Journals are considered “really reliable” only when the “peers” are authoritative Westerners. This is the what the much vaunted scientific

method has been reduced to, in practice. As I have described elsewhere,³⁸ what is at work here is the criterion of *reputability*, quite distinct from Popper's criterion of refutability.

Note that many Indian scientists will revel in exposing Indian superstitions and the like. They will also boldly take up any matter already discussed in the West, like the church vs Galileo, or the cases described by Andrew White. But, in the last 150 years, show me an Indian scientist who has genuinely challenged Western scientific authority, without Western backing, and I will show you a revolution.

Take, for example, the blind superstitious faith in figures like Albert Einstein and Stephen Hawking. The Western educated are taught to believe that while belief in Sai Baba is blind faith, belief in Einstein or Hawking is enlightened. However, blind faith is not about *what* one believes but *why*.³⁹ The vast majority of those who believe in Einstein do not even know any relativity theory, their belief is based, like that of the followers of Sai Baba, merely on the basis of widespread stories and myth. It is true that the Sai Baba's miracles were exposed by rationalists, but so was Einstein's *annus mirabilis* exposed by me. Nobody could answer my critique in the last 20 years; on the contrary, the best-rated mathematical mind in the West sought to grab credit for it,⁴⁰ on the very centenary of Einstein's "miracle year". Still people go on worshipping both Sai Baba and Einstein, although Indian academics, especially left-liberal, are convinced that the one is dead wrong, but the other is right!

Of course, Einstein is not a matter of one individual. It is a reflection on all of Western society that it is so tied to authority that failure of authority at the top can never be challenged. For nearly a century, a fraud and petty con-trickster like Einstein, who learnt some legal tricks as a patent clerk, could be worshipped as the very topmost scientist, and hundreds of thousands of scientists were never once able to challenge his authority, though they would all claim that science is able to challenge authority. (True, Whittaker, in his biography of Einstein for the Royal Society, did point out Poincaré's priority, but he too did not notice Einstein's mistake.)

Note how science itself suffers in the process of this blind belief in Western authority. The theory of relativity was based on a re-examination of the notion of time in Newtonian physics, and *not* on the Michelson-Morley experiment.⁴¹ The latter experiment *could not* have measured the speed of light, for the reason that Newtonian physics does *not* define a proper clock, and speed cannot be measured without that. (That happened because Newton, in his overwhelming desire to make the infinite series of the imported Indian calculus⁴² "rigorous",⁴³ and in accord with his religious beliefs about eternity,⁴⁴ ended up making time metaphysical.⁴⁵) This subject of special relativity is taught at the first year level in the university, and I have personally and repeatedly brought this argument about time to the notice of the faculty in the two largest physics departments in the country in Pune and Delhi. It is also (partly) available in some of the more thoughtful texts on relativity, like that of Synge.⁴⁶ Nevertheless, in the last twenty years, the faculty in these departments is neither able to contest my point publicly, nor willing to change the syllabus. Clearly, they see science not as truth, but as a means to impose Western authority. The scientific method is to blindly follow Western scientific authority and regard all challengers as mistaken, hence not worthy of discussion. Our thousands of "bright" students of IIT all study this, each year, and swallow it all without question. They are all hoping to make good in the West, and acceptance of Western authority is a pre-requisite for that. Naturally, the West praises these "role models".

It is this conviction—that reduces even the scientific method to blind reliance on Western authority—which allows even science to be used for church propaganda,⁴⁷ as in the work of Stephen Hawking. The situation here is, of course, a bit different, for Hawking's work is at another level of technicality not familiar to most physicists, who are under-educated (or overspecialised), by design of Western

education. This last point was very clear in a debate that this author had with Roger Penrose.⁴⁸ In the course of the debate it became amply clear that the professors from Delhi University and JNU present there were unable to follow the argument. Accordingly, Penrose began to bluff, and this author was the only one to catch on.

This belief that the validity of science can only be checked by relying on Western authority is leading Islamic countries to ruin as in the ISI norm of publications imposed by the OIC technical committee, which runs opposite to the agenda of science and technology for economic development agreed by the OIC political leadership. In India, of course, it is the political leadership itself which is trying to impose this agenda of making India subordinate to the West. This belief about the superiority of phoren academics, and reliance on it, is even being incorporated into the latest Indian laws which want to make “international recognition” the dominant aspect of Indian science and technology policy. (Of course, “international recognition”, meaning phoren, does not mean Iranian or Malaysian.) It seems fairly clear that China is also falling into the same trap.

Summary: how Western education captures the mind

To summarise, apart from (1) false history, Western education has (2) inculcated strong prejudices so that a critique of the West is not permitted, or is ignored. Finally, (3) the ultimate test of valid knowledge, even in science, is Western approval, so criticism of the West first requires Western approval!

Decolonisation: Towards freedom and autonomy in thought

How to break this impasse? With the above understanding of the causes of hegemony, the steps to be taken to undo it are clear. First, one must undo the false history of science. Secondly, one needs to have forums for articulating systematic criticism of the West, and this systematic criticism needs to find its way into school and college texts. Third, we need to disassociate valid knowledge from Western social approval, and use more scientific means to decide validity.

Some steps have already been taken. The Western history of science has been shown to be a large-scale fraud, and that includes the cases of “Euclid”, “Claudius Ptolemy”, Copernicus, and Newton. It is only a matter of time before the whole house of cards collapses. The thing that remains to do is to challenge the unethical authors of school texts which still perpetuate that church history without evidence. This is a political matter, and, strangely, in India, academics and parents don’t seem to be much bothered about superstitions being implanted in school children, so long as those superstitions are of Western origin.

The conferences on Academic Imperialism, Hegemony and Decolonising our Universities represent a clear forum where a critique of the West could be articulated. The important step forward is that alternative curricula have been prepared. This is true also for math, science,⁴⁹ and the philosophy of science.⁵⁰ A similar effort is on for the social sciences, as in the Multiversity syllabus for Philosophy.

Will these changed curricula be adopted in our universities and colleges? That remains to be seen. But the academic and political pitch in their favour is very strong.

Mathematics education

Consider the case of mathematics. Mathematics has been touted as universal. However, present-day formal math is not⁵¹ the way mathematics was done in India. Racists historians of science like Rouse Ball have taken this to mean that what was done by “primitive races” in India was not mathematics at all: “land surveying”, not geometry.

The truth is rather more complicated. First, the word mathematics derives from mathesis which was linked by Plato to recollection by the soul of knowledge of its past lives. Second, this notion of soul was agreeable to the early Christian church but was cursed by the post-Nicene church, together with the belief in past lives, in the anathemas against “pre-existence”.⁵² The changed notion of the soul was, in fact, at the dead centre of the religious war that Christians waged against “pagans” resulting in the total destruction of all temples in the Roman empire, the burning of all books, including the Great Library of Alexandria. The historical evidence suggests that it was at this time that the *Elements*, a tract on Egyptian sacred geometry, was completed by Hypatia, daughter of Theon, the last librarian of the Great Library, as a defence of the “pagan” (“Neoplatonic”) notion of soul. Hypatia was raped in a church and killed most brutally. Eventually, as is well known, ca. 530 CE Justinian, the Roman ruler imposed a blanket ban on all philosophy (of which mathematics was then a key part) in the Roman empire.

Mathematics returned to Europe during the Crusades, as Latin translation of Arabic texts. But church priests committed to boasting that they had reached the acme of knowledge, and committed for centuries to the burning of books, could not eat humble pie by admitting that they were learning from those they had declared as their hated religious enemy. Indeed, admitting this would run contrary to the very reasons for which the Crusades were waged—to grab Muslim wealth. However, the church needed that knowledge, for all Crusades (after the first) were military failures, so Muslims could not be converted by force the way all Europe was converted by the armies of Charlemagne. They also could not be converted by means of the scriptures, for they did not accept the Christian scriptures. Knowledge was needed. Therefore, Aquinas recommended that Muslims should be converted by appealing to reason which they accepted. But first reason had to be made into a church weapon. Church doctrine was revised accordingly, to generate the schoolmen’s Christian rational theology, modified⁵³ from Islamic rational theology (*aql-i-kalam*).

Secondly, it was to claim this knowledge in the Arabic libraries at Toledo etc., that the fantastic hypotheses were advanced that (a) all that knowledge had a Greek origin, and (b) even the Arabs added nothing new to it, but only blindly copied what they had received from the Greeks. Apart from commonsense, the merest inspection shows that these hypotheses are absurd. The scholars in the Baghdad Bayt al Hikma clearly received knowledge of mathematics, astronomy, and medicine from India both directly and indirectly via Jundishapur, where it had clearly travelled since the time of Khusrow Noshirvan, as recorded, for example, in Firdausi’s *Shahnama*, which confirms the historical trajectory of the *Pancatantra*. A similar conclusion follows from al Khwarizmi’s *Hisab al Hind* from Latin translations of which Europe first learnt arithmetic beyond the kindergarten Roman abacus. So, from a late (post-Crusade) and accretive manuscript how can one tell where the knowledge in it came from? For example, many manuscripts of the *Almagest* begin with a paraphrase of the controversies in Indian astronomy. (One can, of course, always pile on the hypotheses, and support the concocted “Ptolemy” by concocting further shadowy Greek figures. But this method of piling on hypotheses or telling a thousand lies to defend one lie is something that can be used to support any ridiculous belief.) The hypotheses (b) is equally nonsensical, for the scholars of the Bayt al Hikma, who believed in *aql-i-kalam* were clearly opposed to blind copying which they derided as *naql* or *naqli*, as exemplified by al

Khwarizmi's *Hisab al Hind* which is not a literal translation of any known Indian source.

It was in this tradition of concocting Greeks as the source of the knowledge in Arabic books that "Euclid" was invented in the Crusades and passed off as the author of the *Elements*, even though Greek texts of it never mention "Euclid", but mention Theon or the lectures of Theon as the source for that book.⁵⁴ More than that, through a forged passage inserted into Proclus *Commentary* on the *Elements*, the entire philosophy of the *Elements* was changed from Neoplatonism, opposed to church doctrine, to the suit the new found church doctrine of reason. It is remarkable how Indian historians never remarked at the strangeness of a text written in the -3rd c. CE blending so completely with post-Crusade Christian doctrine. For the philosophy that mathematics is compelling proof was then a need of the church, but never was it a social necessity in Greek history.

The religious bias in present-day formal mathematics

It is this idea of mathematics as proof that has developed into present-day formal mathematics. Now it is always a good thing to have a proof of things, but Western formal math has a peculiar notion of proof. For example, all Indian systems of philosophy accept the *pratyaksa*, or the empirically manifest, as the first means of proof. However, Western philosophy believes that the empirical is not reliable, but that metaphysics is more reliable. This is incorporated in the belief drilled through Western education that induction is fallible, but deduction is certain. Note how this belief, at one stroke, eliminates all systems of Indian philosophy as unreliable.

It is naturally dangerous to declare the empirical as untrustworthy, for how can there be agreement on metaphysics? In the tradition of myth-building for power, the church has simply declared its metaphysics as universal. That is obviously false, as has been pointed out by this author. Thus, deduction (and deductive mathematical proofs) are based on logic, and logic is not universal. For example the Buddhist logic of *catuskoti*, the Jain logic of *syadavada*, the logic of natural language and quantum logic are all different from the two-valued and truth-functional logic assumed in present-day formal mathematical proof. Thus, the axioms being arbitrary, and the choice of logic being arbitrary, the theorems of mathematics do not incorporate any sort of universal truth. On the contrary, their role is to instill a religious bias in the thinking of the Western educated.⁵⁵ Note that the bias exists even though one of the founders of formalism, Russell, was a declared atheist and non-Christian. There is nothing peculiar in this, for culture influences even those opposed to it, such as Nietzsche, who, despite his pronounced anti-Christian views, was fundamentally a victim of Augustine's dichotomy between "linear" and "cyclic" time.

To be sure, arithmetic, calculation, and mathematical models of natural phenomena all preceded Christianity by thousands of years, and there is nothing at all wrong with them. One should continue to use mathematics for calculation, and for all possible practical applications. The point is only to eliminate the Christian twist in mathematics as metaphysical (and later formal) proof, which proof has nil practical value.

Physics, calculus and Newton

To move on to physics, the reinterpretation of the *Elements* as a doctrine of reason, to suit church purposes, did not completely eliminate the earlier Neoplatonic understanding of mathematics as eternal

truths (which arouse the eternal soul, through sympathetic magic); that earlier understanding of mathematics persisted alongside. The combination resulted in a bastardised understanding of mathematics as a doctrine of reason which incorporates eternal truths. Because of the Augustinian legacy of post-Nicene tinkering with beliefs about the soul, the post-Crusade Christian doctrine of reason was compelled to believe that God ruled the world with eternal laws, and did not make direct providential interventions. From this it was a small step to believe that the laws of nature were written in the language of mathematics, for mathematics was (still) believed to incorporate eternal truths. (The notion of “eternal” was different from the Neoplatonic notion, for already the 5th c. had seen a controversy between Proclus, a commentator on the Elements, who maintained that the eternal truths of mathematics showed that the cosmos itself was eternal, hence uncreated. John Philoponus, in his *Apology Against Proclus*, controverted Proclus’ arguments by using specifically Christian notions of eternity, compatible with Augustine’s apocalyptic time.

It was this religious belief in mathematics as eternal truth (with eternity understood in a specifically Christian theological sense) which was at the base of the European misunderstanding of the calculus, when the Indian infinite series first arrived in Europe. Thus, Descartes and Galileo both thought it would take an eternity of time to sum an infinite series, so that such sums (like the number pi) were “beyond the human mind”, as Descartes asserted. Newton, whose *Principia* mimics the style of *Elements*, was particular about rigor. In his attempts to make calculus rigorous, Newton made time metaphysical.⁵⁶ This is exactly what led to the failure of his physics. It needs to be replaced as described.⁵⁷ In particular, this means that the physics curriculum should teach functional differential equations.

Natural laws and Islam

Another key aspect of the penetration of theology into science is the belief in “natural laws”. This is a specifically Christian belief, not found in Islam. This belief is commonly treated as part of science, and is used as such in current propaganda against Islam, in the Guardian, London, for example.⁵⁸ At the academic level, this wrong belief is taught in courses on philosophy of science. Current physics and philosophy of science courses need to emphasize⁵⁹ that this is not a scientific belief (since not refutable) but a religious one (since found in Christian theology).

The OIC and the ISI norm

Finally, there is the question of why we do science? As the OIC political leadership correctly resolved, science is to be done for socio-economic advancement of the society. However, in a shocking development, the OIC technical committee reinterpreted socio-economic advancement to mean “Western social approval”. What is followed in OIC countries today is the norm set by the technical committee, and not the target of socio-economic benefit set by the political leadership. This has disastrous and suicidal consequences, for it makes the scientists in these countries totally dependent on the goodwill of Western editors, for everything from appointments, to promotions, to research grants. This blanket trust in Western editors is, of course, misplaced, given the blatant dishonesty that some of them have publicly demonstrated.⁶⁰ The right way to measure scientific output is through concrete benefits to society, and not through Western-pats-on-the-back, which can be as misplaced as the Nobel prizes for peace and literature.

Summary and Conclusions

The key measures that are being proposed to decolonise and achieve freedom and autonomy in thought are all rather simple.

The key point is of course to break the “trust the West” formula that is instilled into the Western educated.

Students need to be taught that belief in Einstein or Stephen Hawking is not less superstitious than the belief in Sai Baba, just because those figures are endowed with high scientific authority in the West. They should be taught to use right means of validating knowledge, without relying on authority. (This applies also to decision makers who should not rely on the privately expressed opinions of “experts”, since this may involve a conflict of interests,⁶¹ but should use public discussions.)

The disastrous consequences of relying on Western authority need to be exposed starting by exposing the false Western history of science, and its role in establishing colonial hegemony, since Macaulay and Rammohun Roy.

The disastrous consequences of Western education need to be exposed in the way it encourages blind reliance on figures of Western authority like Einstein or Hawking. People should be encouraged to learn to be self-reliant in these decisions.

The unconstitutionality of present-day math

The syllabus for mathematics needs to be changed to avoid the religious bias in present-day formal mathematics, and to make it practically oriented. Specifically, the teaching of limits, formal real numbers, and set theory ought to be dropped as worthless, and replaced by the teaching of calculus without limits.⁶² As stated at the conclusion of that paper, this involves a conflict of interests.

Various stakeholders (such as students afraid of math, or their parents) are *never* consulted to decide what sort of math to teach. Even scientists and engineers are rarely consulted regarding what sort of math ought to be taught to them. However, if all decisions regarding the math curriculum are left solely to math “experts”, there is an obvious conflict of interests: for these experts were brought up on the older tradition of formal mathematics, and rejecting formal mathematics may well make their past work valueless.

Normally, it would be a difficult matter to break the stranglehold of these experts, as the experience of the last four years in India has demonstrated. Clearly “Westernism” is a much stronger force than Brahmanism, and something equally strong is needed to break it. However, as that paper concluded, the key point to notice is that hanging on to their personal interests is not only unethical, it is *illegal*.

Public discussion is one way to ensure that the interests of millions of students are not disadvantaged, and that scientific and educational activities relate to public interest...Such discussions would be particularly welcome given the other sensitive issue in the present case: namely that imposing a religiously biased metaphysics on millions of students is not only unethical, it is unconstitutional under the Indian constitution which guarantees secularism, or under any other constitution which does not permit a Western religious bias.

Experts who continue with present-day formal mathematics, and ignore the above criticism, are clearly laying themselves open to the charge that they refuse to engage in public discussion since they are doing what they know to be wrong and indefensible. This lays them open to the risk of being hauled up for doing religious propaganda in the name of teaching a notionally secular mathematics.

Science and the philosophy of science

Since science is based on math, such fundamental changes in math, at the level of the understanding of the calculus and numbers, are bound to be reflected in corresponding changes in science. Specifically, the teaching of relativity and its consequences needs to be changed. More generally, the teaching and practice of science needs to be changed to orient it towards socio-economic benefit and not towards acquiring “prestige” from Western social recognition. Specifically, the ISI norm adopted by OIC countries needs to be revoked.

The teaching of philosophy of science needs to be changed along the lines of the syllabus outlined.

De-Westernised education should further enable autonomous thought by breaking out of the mould of present-day specialised education, geared to the purpose of industrial capitalism. Education should not solely build industrial workers, it should produce good human beings with enough knowledge to judge things for themselves. That would be true *swaraj* in thought.

- 1 Other affiliations include Inmantec, Delhi NCR, and Centre for Studies in Civilisations, New Delhi. The title of the paper aims to make a minor distinction from Mahatma Gandhi's *Hind Swaraj*, and from K. C. Bhattacharya's "Svaraj in Ideas", (reprinted, *Indian Philosophical Quarterly*, **11**(4) (1984) pp. 383-393) since both the notion of "Hind" and "Ideas" are foreign to India, and the Platonic notion of "ideas" cannot be readily translated into Hindi, say, except as "thought". The paper clearly intends to reinforce that line of thinking especially in the neglected areas of hard sciences.
- 2 Syed Husain Alatas, "The Captive Mind and Creative Development", and in "Indegeneity and universality in social sciences: a South Asian response", ed. Chandan Sengupta, Sage, 2004, pp. 83-98. (Earlier version published in *International Social Science Journal* 26(4) (1974))
- 3 Not out of a sense of vindictiveness, but because similarly exclusive academic clubs flourish to this day, though they no longer hang the signs outside.
- 4 People still confound colonialism with mere physical occupation, for an example see my response "History must be based on evidence" in *Sun*, Malaysia, 12 Aug 2011, clipping archived at <http://ckraju.net/press/2011/the-Sun-12-Aug-2011-clipping-ckr-response.gif>. The full set of clippings is at "Conversations in the Sun", <http://ckraju.net/?p=61>.
- 5 Rammohun Roy, letter to Bentinck, 11 Dec 1823. This may be found online on many sites, such as <http://www.languageinindia.com/april2003/macaulay.html>.
- 6 T. B. Macaulay, Minute on Education, 1835. For an online version, see above.
- 7 C. K. Raju, *The Eleven Pictures of Time*, Sage, 2003. I mention this because many response in the decolonisation debate suggested that even seasoned academics were confused about this notion, and naively thought of the West as west or just a direction in space.
- 8 Rammohun Roy, *The Precepts of Jesus, The Guide to Peace and Happiness...*, Calcutta, printed London, 1823 by the Unitarian Society. .
- 9 And, when they did praise some things, they always picked the examples favorable to them: Gandhi never got the Nobel prize, which Tagore did, for he managed to remain remarkably little involved in politics at a time when the whole country was in revolt, and he never opposed the British like Gandhi.
- 10 C. K. Raju, *Is Science Western in Origin?* Multiversity, Penang, 2009. And C. K. Raju, *Cultural Foundations of Mathematics*, Pearson Longman, 2007.
- 11 Immanuel Kant, *Observations on the Feeling of the Beautiful and the Sublime*, trans. John T. Goldthwait, University of California Press, Berkeley, 1991, pp. 110-1.
- 12 David Hume, "Of National Character" (1748), in *The Philosophical Works of David Hume*, Volume III, Bristol: Thoemmes Press, 1996, p. 228.
- 13 R. R. Newton, *The Crime of Claudius Ptolemy*, Johns Hopkins University Press, Baltimore, 1977.
- 14 The debate was in H-Asia, and is archived on my blog, <http://ckraju.net/blog/?p=56> and previous entries. Also archived elsewhere on the Internet. Incidentally, Witzel grandly announced that my mistake was to suppose that early Indian dice were cubic, and explained that this mistake arose due to bad translation. In fact, my paper never mentioned the word "cube" (I spoke of dice with five faces), and I did my own translations, and so on. In the absence of a public rejoinder, Witzel's absurd opinions would have stood on the reputation of Harvard.
- 15 N. M. Swerdlow and O. Neugebauer, *Mathematical Astronomy in Copernicus's De Revolutionibus*, Springer-Verlag, New York, 1984, part 1, p. 47. George Saliba, "Arabic Astronomy and Copernicus", *A History of Arabic Astronomy*, New York, 1994, chp. 15. For a more recent update, see <http://www.columbia.edu/~gas1/project/visions/case1/sci1.html>.
- 16 Owen Gingerich, "Islamic astronomy", http://faculty.kfupm.edu.sa/phys/alshukri/PHYS215/Islamic_astronomy.htm.
- 17 Cited above
- 18 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.
- 19 C. K. Raju, *Is Science Western in Origin?* Multiversity, 2009.
- 20 C. K. Raju, *Ending Academic Imperialism: a Beginning*, Citizens International, 2011. Also, "Ending Academic Imperialism in Hard Sciences: a Beginning," in *Confronting Academic Knowledge*, ed. Sue-San Gahremani Ghajar and Seyyed-Abdolhamid Mirhosseini, Iran Universities Press, Tehran, 2011, chp. 7.
- 21 Claude Alvares and Shad Saleem Faruqi (ed), *Decolonising our Universities*, Citizens International and USM, 2011.
- 22 C. K. Raju, *Ending Academic Imperialism: a Beginning*, cited above.
- 23 These public reactions are documented at <http://ckraju.net/?p=61>.
- 24 The issue was raised in my plenary talk at the Indian Social Science Congress in Dec 2007 in Mumbai in the form of "Buddhist mathematics". For more details, see "Buddhist mathematics on Ambedkar Jayanti", <http://ckraju.net/blog/?p=11>. They were subsequently raised with the National Knowledge Commission, and with its members individually. See, e.g., "National Knowledge Commission and Math Education: an Open Letter to Sam Pitroda", <http://ckraju.net/blog/?p=23>.
- 25 E.g. <http://ckraju.net/?p=62>. See also the columns of Zainon Ahmad in the *Sun*, Malaysia, archived at the link above: "Decolonisation begins with us", and "An inquiring mind will set you free".
- 26 "Decolonising math and science", paper presented at the conference on "Decolonising our universities", Penang, 2011.

- In: Claude Alvares and Shad Faruqui ed., cited above. Draft at <http://ckraju.net/papers/decolonisation-paper.pdf>. Video (first half-hour) at <http://vimeo.com/26506961>.
- 27 C. K. Raju, *Economic and Political Weekly* 46(34) 20 Aug 2011, corrected the error once. For more details on how this error persisted, see <http://ckraju.net/blog/?p=65>.
 - 28 S. Ramani, *Economic and Political Weekly*, 23 July, 2011. Report on “Decolonising our Universities” conference.
 - 29 C. K. Raju, “Decolonisation: Time for Change”, <http://globalhighered.wordpress.com/2011/09/11/decolonising-our-universities-time-for-change/>,
 - 30 Barrow made this point in response to one Francis Aston’s attempts to obtain such a royal dispensation. For references to the original letter, see the revised biography of Newton by R. S. Westfall, *Never at Rest*, Cambridge University Press, paperback edition, 1983, p. 332.
 - 31 “A society of would-be clerics intent on preferment and constrained by the principle of seniority did not allow the ladder all must climb to be clogged with non-clerics who could hold their fellowships forever.” Westfall, *Never at Rest*, cited above, p. 330.
 - 32 See especially the case of the false biography of Newton knowingly penned by Western historians for centuries, and the attempts by the Cambridge authority on Newton, the late Whiteside, to defend those lies by further lies and by abusing me for challenging them. For an account of the falsehoods, see C. K. Raju, “Newton’s Secret”, chp. 4 in *The Eleven Pictures of Time*, Sage, 2003. For references to the exchange with Whiteside, see C. K. Raju, “Decolonisation: Time for Change”, <http://globalhighered.wordpress.com/2011/09/11/decolonising-our-universities-time-for-change/>, citations on Whiteside.
 - 33 For more details, see *The Eleven Pictures of Time*, cited above This process had already begun from the time of Malthus. It is interesting to note how this put Marx into a difficult position: he criticised Malthus but appreciated Darwin whose theories drew upon the mathematical nonsense that Malthus wrote.
 - 34 For more details, see C. K. Raju, “Kosambi the mathematician” *Economic and Political Weekly* 44(20) May 16–22 (2009) pp. 33–45.
 - 35 For an example, see C. K. Raju, “Classical Time-Symmetric Electrodynamics”, *J. Phys. A: Math. Gen.* 13 (1980) pp. 3303–17. Also, C. K. Raju, (Adjudicator’s report) “On J. V. Narlikar’s ‘Four Questions That History Might Answer’ ” *Sandhân* 1 (1) 2001, pp. 164–167.
 - 36 This happened during the *Symposium on Mathematics in Relation to History, Culture and Technology, India International Centre*, New Delhi, Nov 2007.
 - 37 I am, of course, well aware of the controversy over the introduction of Vedic Astrology in the university syllabus, and was one of the tree participants, and the only one from the Indian university system, in the debate on “Vedic Astrology in University Education: a Sound Decision?”, organized by the India International Centre, 1 Dec 2001. (The other two were Raja Ramanna and Pushpa Bhargava, who fought and lost the case in the Supreme Court in that matter.) C. K. Raju, “The Emperor’s New Course”, unpublished, but ms available on request.
 - 38 C. K. Raju, “Benchmarking Science: a Critique of the Thomson-Reuter (ISI) Index. Paper presented at the PSU-USM International Conference on Humanities and Social Science, October, 2011, Hat Yai, Thailand. In Proc., and at <http://ckraju.net/papers/Benchmarking-sci3ence-paper.pdf>. Iso address to conference of Deputies (Vice Chancellors etc) in Khurramshahr, Iran, March, 2011.
 - 39 C. K. Raju, “Science is about why not what”, *Sun*, Malaysia, 6 July 2011, p. 9 . <http://ckraju.net/press/2011/the-Sun-6-July-p09-clipping-ckr-response.gif>.
 - 40 See the belated acknowledgment of my work: M. Walker, “Retarded Differential Equations and Quantum Mechanics”. *Notices of the American Mathematical Society* 54(4), 2007, p. 472. Available at <http://www.ams.org/notices/200704/commentary-web.pdf> (scroll to the 2nd page). The Society for Scientific Values later found a *prima facie* case against Atiyah, see <http://www.scientificvalues.org/cases.html>, case no. 2 of 2007, Atiyah-Raju case. This belated acknowledgment to my work still suppressed the fact that Atiyah was already informed of my work (http://ckraju.net/atiyah/Suvrat_email.pdf), long before the publication of the article which again sought to appropriate credit to Atiyah. (G. W. Johnson and M. E. Walker, “Sir Michael Atiyah on the Nature of Space”, *Notices of the American Mathematical Society*, 53(6), 2006, pp. 674-678) Annotated excerpts at: http://ckraju.net/atiyah/Johnson_Walker_excerpt.pdf. Naturally, Atiyah was consulted by the authors of the article, prior to publication (http://ckraju.net/atiyah/Walker_email.pdf). Of course, even before he was directly informed by me, and acknowledge it in 2005, Atiyah should already have known about my books and papers and stand on Einstein which was widely publicised, well before his 2005 Einstein centenary lecture in which he first claimed credit.
 - 41 C. K. Raju, “On Time. 3A: Michelson Morley Experiment”, *Physics Education*, 8 (1991) pp. 193–200. Also chp. 3a in C. K. Raju, *Time: Towards a Consistent Theory*, Kluwer Academic, Dordrecht, 1994.
 - 42 C. K. Raju, *Cultural Foundations of Mathematics*, cited above, chp. 3: “Infinite series and pi”
 - 43 For the debate with Berkeley, see *Cultural Foundations of Mathematics*, chp. 8, “Numbers in Calculus, Algorismus, and Computers”. And chp. 9. “Math Wars and the Epistemic Divide in Mathematics”.
 - 44 “Decolonising math and science” cited above, <http://ckraju.net/papers/decolonisation-paper.pdf>.

- 45 C. K. Raju, "On Time. 2: Newton's Time", *Physics Education*. **8** (1991) pp. 15–25..Also, in *Time: Towards a Consistent Theory*, Kluwer, 1994. Also,
- 46 J. L. Synge, *Relativity: the Special Theory*, North Holland, Amsterdam, 1956, pp. 161-2. .
- 47 C. K. Raju, "The Christian Propaganda in Hawking's Work", DNA, 16 Jan 2011, p. 9.
http://www.dnaindia.com/lifestyle/review_the-christian-propaganda-in-stephen-hawkings-work_1495047. For a cutting, see <http://ckraju.net/blog/?p=50>. .
- 48 debate with Roger Penrose. C. K. Raju, "Penrose's Theory of the Mind: a Rebuttal", *The Matter of the Mind*, India International Centre, New Delhi, 22–23 December 1997. For further details of the content, see C. K. Raju, *The Eleven Pictures of Time*, Sage, 2003, chp. 5
- 49 "Decolonising math and science", paper presented
- 50 For a draft syllabus for the philosophy of science see <http://ckraju.net/papers/PSc-draft-syllabus.html>.
- 51 "Computers, Mathematics Education, and the Alternative Epistemology of the Calculus in the YuktiBhâsâ", *Philosophy East and West*, **51**(3) (2001) pp. 325–362. Available from <http://ckraju.net/papers/Hawaii.pdf>. Also, "Mathematics and Culture", in *History, Culture and Truth: Essays Presented to D. P. Chattopadhyaya*, Daya Krishna and K. Satchidananda Murthy (eds), Kalki Prakash, New Delhi, 1999, pp. 179–193.
- 52 C. K. Raju, "Curse on 'cyclic' time", *The Eleven Pictures of Time*, cited above, chp. 2.
- 53 For details of the modification, and the reasons for it, see C. K. Raju, "Benedict's maledicts", Zmag, <http://zcommunications.org/benedicts-maledicts-by-c-k-raju>. Reprinted in *Indian Journal of Secularism*, **10**(3) (2006) pp. 79-90.
- 54 C. K. Raju, "Good-Bye Euclid!", *Bharatiya Samajik Chintan* **7** (4) (New Series) (2009) pp. 255–264.
- 55 "Teaching math with a different philosophy 1. Formal mathematics as biased metaphysics", *Science and Culture* **77**(7-8), 2011, pp. 275-80. <http://www.scienceandculture-isna.org/July-aug-2011/03%20C%20K%20Raju.pdf>. This bias has been pointed out for over a decade, since my articles on mathematics and culture and alternative epistemology, cited above (ref. 51). It was also pointed out in "The Religious Roots of Mathematics", *Theory, Culture & Society* **23**(1–2) Jan-March 2006, Spl. Issue ed. Mike Featherstone, Couze Venn, Ryan Bishop, and John Phillips, pp. 95–97, and, of course, in *Cultural Foundations of Mathematics*, cited above.
- 56 Ref. to "Newton's time" above, and "Time: What is it That it can be Measured" *Science&Education*, (Kluwer/Springer) **15**(6) (2006) pp. 537–551.
- 57 See, *Time: Towards a Consistent Theory*, cited above, and "Decolonising math and science" cited above.
- 58 C. K. Raju, "Islam and science-1", *Indian Journal of Secularism*, **15**(2), 2011, pp. 14-29.
- 59 As in the revised syllabus suggested at <http://ckraju.net/papers/PSc-draft-syllabus.html>.
- 60 C. K. Raju, "Decolonisation: Time for Change", <http://globalhighered.wordpress.com/2011/09/11/decolonising-our-universities-time-for-change/>, especially the case of the role played by the editor of the *Notices of the American Mathematical Society*, in the Atiyah case. Briefly, he refused to divulge the full facts that this was the second time that Atiyah had tried to grab credit. He refused to allow the resulting mistake to be pointed out in his journal, preferring instead to preserve it. He refused even to divulge the date of submission of the Johnson-Walker article, cited above, since that would have provided objective evidence that Atiyah gave his consent to the article well after he was informed of my work.
- 61 "Decolonising math and science", paper presented at the conference on "Decolonising our universities", Penang, 2011. In: Claude Alvares and Shad Faruqui ed., cited above. Draft at <http://ckraju.net/papers/decolonisation-paper.pdf>.
- 62 "Teaching Mathematics with a Different Philosophy. 2: Calculus without limits". *Science and Culture*, **77** (7-8), 2011, pp.281-86. <http://www.scienceandculture-isna.org/July-aug-2011/04%20C%20K%20Raju2.pdf>.