

Saffronized Science: Rampant Pseudoscience in “Vedic Garb” in the Indian Subcontinent¹

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Some years ago, I happened to watch an advertisement for Rajnigandha *paan masala*³ on TV that struck a nerve with me. This is how it went: A bespectacled young Indian man in a tweed jacket is sitting in a classroom at an American campus where a professor is writing some rather complicated looking mathematical equations on the chalk board. The young man appears bored; he is looking out of the window and doodling on his notepad. Speaking in an exaggerated American drawl, the professor asks how much time the class will need to solve a problem causing all the European and Chinese-looking students to balk at the task claiming the problem is too tough. Muttering racist-sounding epithets, the professor calls upon the *desi*. The Indian student gets up, takes out a small can of *paan masala* from his jacket and puts some in his mouth. He then walks up to the board and solves the mathematical problem without a moment's hesitation. The classroom breaks into cheers. The image of a packet of Rajnigandha *paan masala* appears on the screen with the following voice-over: “We already knew the answer. Waiting for the question is our culture.” The advertisement ends with a jingle: “With Rajnigandha in your mouth, the world is at your feet.”⁴

With some foresight, the ad-agency could have amassed a considerable fortune by selling this slogan (sans the jingle) to the Sangh Parivar.⁵ The young *paan-masala* consuming fellow could have achieved lasting fame as the mascot of the new geeky Indian that we so love to celebrate. “We already knew the answer. Waiting for the question is our culture” would make an excellent backdrop for any number of “science in the Vedas” events that the Parivar and its allies like to host. The beauty of the slogan is that it can capture the

¹ Edited by Stefano Bigliardi. What follows is a slightly adapted version of Meera Nanda's Introduction to her newly published monograph *Science in Saffron - Skeptical Essays on History of Science* (Palm Vihar, Gurgaon: Three Essays Collective, 2016).

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Nanda describes and criticizes, with clarity and irony, several forms of pseudoscientific discourse that are rampant in the Indian subcontinent and mainly (but not exclusively) serve a nationalist political agenda. Saffron is the colour that traditional Hindu (and Buddhist) monks wear, and it is the chosen colour of the Hindu Right. Hence, the pseudoscientific discourse criticised by Nanda is described as “saffronized.” The claims of saffronized science often bear a striking similarity to some popular claims that emerge in the debate on Islam and science SERRC readers are familiar with.

Nanda's brilliant pages teach us how pseudoscience, in different guises and in different cultures, constantly goes hand in hand with feelings of inferiority and cultural revanchism—a constituting trait of the postmodern world not only to be studied but intellectually confronted. Her engagement is an example for all those who are interested in respecting national and religious identities but likewise the value of scientific investigation.

³ A mix of spices, sweeteners (and sometimes tobacco) that goes into a betel leaf that is then chewed. The *masala* can be consumed without the betel leaf.

⁴ Currently available at: <https://www.youtube.com/watch?v=cmOCUQvyCIM>

⁵ Hindu nationalist organizations.

spirit of whatever scientific answer you may be in the mood to fit into “the Vedas” on any particular day—robotics, nuclear energy, quantum physics, Einstein, the theory of evolution, genetics, consciousness ... the list is limited only by your imagination.

Priority-claims on behalf of ancient Indian mathematicians and physicians regarding landmark scientific discoveries (the Pythagorean Theorem, zero, genetics and surgery) have been a fixture of Indian public discourse for a long time, and have been given a fresh impetus at a variety of high-visibility gatherings over the last year or so.

The monograph *Saffronized Science* is provoked by the constant assault on our collective intelligence from those who are convinced that “We already knew the answer.” Yet it is more than mere irritation that has motivated me. I believe that the constant appropriation of modern scientific concepts and theories for the glory of “the Vedas” is one, if not *the*, central plank on which the myth of Hindu supremacy rests. It is thanks to this myth of “scientific Hinduism” that our preeminent national figures, past and present, habitually sneer at the “superstitions” of Abrahamic religions. It is thanks to this myth that we think of ourselves as a “race” endowed with a special faculty for science. It is thanks to this myth that we go around the world thumping our chests as “scientific Indians”, without whom the world of science and economy would grind to a halt.

Such myths of national exceptionalism and supremacy are dangerous. Nothing but evil follows when such myths manage to take hold of a nation’s imagination. It is for this reason that this smug, self-adoring myth that the “Vedas” have all the answers—even before scientific questions were possible to ask!—must be taken seriously. Each one of its claims must be examined with utmost attention, using the best available evidence that the history of science has to offer. After we are done laughing at some of the utterly outlandish claims, we must get down to the serious business of analyzing what they are saying in light of what we know about how science developed in the modern world and how it differs from other forms of knowing the world. The time has come for intellectuals to step out of their ivory towers and challenge the distortion of the history of science for ideological ends.

Such a response has not been forthcoming or, at least, has not been proportional to the enormity of the challenge. The scientific community in India—whose turf is being encroached upon—has offered only a deafening silence so far (with rare exceptions who can be counted on the fingers of one hand). What is even more disheartening is the silence of Indian historians of science against the blatant encroachment on their turf. Indeed, the silence of academic historians of science is more worrisome as it is symptomatic of postmodernist malaise that continues to afflict the humanities and social sciences in India. How can those scholars, who cannot utter the words “modern science” without putting them under contemptuous scare-quotes that question the very distinctiveness and legitimacy of the enterprise of science, be expected to start demarcating modern science from Vedic or any other “alternative” knowledge system? How can those, who cannot bear to refer to the mainstream and global history of science without qualifying it as “colonial” and “Eurocentric”, be expected to turn to the same history for evidence to counter the priority-claims of our nationalist mythmakers?

Claims to the effect that “it is all in the Vedas” –where “all” includes all known facts and artifacts of modern science and technology (yes, the airplanes too) are not new. Swami Dayananda Sarasvati, the founder of the religious reform movement Arya Samaj, had already proclaimed this as far back as around the mid-19th century. Likewise, claims of there being “perfect harmony” between the teachings of Hindu *shastras* (precepts) and modern science can be traced back to the New Dispensation of Keshub Chandra Sen in the late 1800s, and to his more famous protégé, Swami Vivekananda. In his famous address to the World Parliament of Religions in Chicago in 1893, Vivekananda proudly proclaimed the latest discoveries of modern science to be mere “echoes” of Vedanta philosophy.

Thus, the current craze for finding modern science in ancient religious texts is part and parcel of the history of modernity in India. It has been the dominant trope for accommodating modern science with the Hindu belief-system. In the hundred plus years that separate Swami Dayananda and Swami Vivekananda from us in the 21st century, this style of accommodating science and Hindu beliefs has become a part of the common sense of most Indians. It is not considered particularly right-wing or left-wing, as elements of it can be found among people and parties of all political persuasions.

While it cuts across political affiliations, the eagerness for scientific legitimation of Hindu *dharma* is more actively and self-consciously fostered by Hindu nationalists and their allies. Attribution of great scientific discoveries to ancient Hindu *rishi-munis* (inspired poets) has been an integral part of the indoctrination of *swayamsevaks* (Hindu nationalists) since the very beginnings of the organized Hindu Right in the early decades of the 20th century. This explains why every time the Hindu nationalists come to power, the first thing they do is to start revising history with a special place reserved for the history of science. During their first stint from 1998 to 2004, the BJP-led NDA (National Democratic Alliance) pushed for introducing degree-courses in astrology, *karma-kanda* (rituals) and “consciousness studies” in colleges and universities.

Thanks to the policies put in place by NDA 1.0, any aspiring astrologer or priest can get a diploma from public or private institutions that have been given the status of universities. Now that the BJP-led⁶ alliance is back in power, revising the history of science is once again on the top of the list of educational “reforms.” NDA 2.0 has lost no time in extending its campaign rhetoric of “India First” to history of science. Claims of India’s priority in everything from mathematics, medicine and surgery—to say nothing of nuclear weapons, spaceships and other Star Trek-style technologies—have been made by prominent people at prestigious, national-level gatherings.

The ball was set rolling by none other than the Prime Minister in his inaugural address at Sir H.N. Reliance Foundation Hospital in Mumbai in October 2014. This was followed by events at the 102nd annual Indian Science Congress in Mumbai in early January 2015. Other relatively high-visibility events, where a seamless continuity between modern science and ancient sciences and myths was on the agenda, include the exhibition in Lalit Kala Academy in New Delhi titled “Cultural Continuity from Rigveda to Robotics,” and

⁶ Bharatiya Janata Party: Right-wing party.

a seminar on Vedic chronology organized by the Sanskrit department at Delhi University, both in September 2015. Behind all these high-profile events, there are any numbers of “Shiksha Bachao” (“save our Education”) activists who want this “history” to become a part of school curricula.

Roughly four kinds of appropriations of modern science for the glory of Hindu sages-scientists can be discerned:

1. Staking priority-claims for ancient India for landmark discoveries in mathematics and medicine. The perennial favourites in this category are the Pythagorean Theorem, algebra and zero in mathematics.
2. Erasure of lines of demarcation between myth and historical evidence. This was the Prime Minister’s chosen rhetorical device at the inaugural address at the Mumbai hospital mentioned above. He invoked the elephant-headed god Ganesh as evidence for plastic surgery and Karna, a character from the epic poem *Mahabharata*, as evidence for “genetic science.”
3. Erasure of lines of demarcation between science and certified pseudosciences like astrology. While this strategy of giving a sheen of respectability to discarded knowledge has not disappeared from the public sphere, it has not been openly espoused from high places lately.
4. A higher kind of pseudoscience that is generated by grafting spiritual concepts like *prana* (or breath), *prakriti* or *akasha* (the “subtle” material substrate of nature) on to physicists’ concepts of “energy” and “ether”; karmically determined birth and rebirth on theories of evolution of species; *chakras* with actual neural structures, and so on and so forth.

Why such mental gymnastics? Why this national itch to be crowned “First”? What look like obvious, and even laughable, contortions begin to make perfect sense when we understand what our saffronizers are really up to. What is it that they seek to accomplish by their constant and desperate attempts to claim the stamp of “science” for the worldview they want to propagate?

We have to understand that the Hindu nationalists are not in the business of history-writing, even though they may use historical evidence if and when it suits them. No, what they are doing is fabricating a heritage that we are supposed to kneel before in awe and wonder and feel special about. While no history is completely free of biases and errors, historians at least try to correct their narratives in light of better evidence. Heritage-makers, on the other hand, thrive on errors and biases. The tortuous logic, the flights of fancy, the mental gyrations are no circus: they are the tools of the trade needed to create the myth of the “scientific Indian,” the bearer of the ancient Hindu heritage which was scientific—in the sense of Science as We Know it Today, or SaWKiT—even before SaWKiT was born.

The “scientific Vedas” rightfully belong to the “Incredible India!” campaign which sells Indian heritage primarily to foreign tourists, with the difference that the “heritage sites” for the former are not physical but textual, and the target audience includes Indians first and foreigners only secondarily. The way the “scientific heritage” is constructed and sold, however, is turning Indians into tourists in their own history.

A case in point: the Prime Minister Modi invoked Ganesh from mythology and Karna from the Mahabharata as “evidence” that plastic surgery and genetic science existed in ancient India, and he went on to explain:

“If we talk about space science, our ancestors had, at some point, displayed great strengths in space science. What people like Aryabhata had said centuries ago is being recognised by science today. What I mean to say is that we are a country which had these capabilities. We need to regain these.”⁷

The PM is hardly alone. Indian Firsters routinely claim that by highlighting the scientific accomplishments of ancient Hindus, they are actually trying to promote a culture of science and scientific temper. This is how the argument unfolds: Indians are heirs to a great civilization which promoted reasoned inquiry, which then led to scientific ideas which are only now being “rediscovered” by modern science. As the beneficiaries of this great civilization, we ought to be inspired by it, reclaim its scientific spirit and produce world-class science again. While they would not put it so starkly, even some secular historians of science have bought into this business of promoting “cultural ownership” for the goal of doing good science.

Once we see the “science in the Vedas” discourse for what it is—a fabrication of heritage—three questions arise. The first question has to do with the relationship between the glorious past and present state of affairs. Here we will ask if it is really the case that because we were, presumably, great in the sciences once, we will be great again. The other two questions have to do with how “scientific” heritage is put together and made to appear reasonable. Here we will examine two favourite ploys of heritage-makers, namely presentism and parochialism. Let us look at these issues seriatim.

Let us start with the promise of becoming great “again.” We seem to think that by glorifying our ancient knowledge-traditions, we are providing cultural self-confidence to the present and future generations of scientists. We seem to think that if we can establish continuity between ancient and modern modes of inquiry, we will gain confidence in our presumably “innate” acumen to do science. However, the notion of continuity between the science of antiquity—not just the sciences of Indian antiquity, but of any ancient civilization in the world—and modern science is unwarranted and unproductive. It is unwarranted because it does not acknowledge the break from the tradition that happened with modern science.

⁷ See Rahman, Maseeh. 2014. “Indian prime minister claims genetic science existed in ancient times” *The Guardian* online, 28 October: <http://www.theguardian.com/world/2014/oct/28/indian-prime-minister-genetic-science-existed-ancient-times>

The science that emerged after the Scientific Revolution through the 16th to 18th centuries was a very different enterprise from all earlier attempts to understand nature. Most historians of science agree on the following revolutionary transformations that marked the birth of modern science:

1. Mathematization of nature, i.e. a growing attempt to describe natural things and events in mathematical terms which could be quantified, using increasingly precise tools of measurement (clocks, compasses, thermometers, barometers and such).
2. Fact-finding experiments in addition to direct observations. In the hands of early modern scientists (represented by the paradigmatic figure of Galileo), mathematization of nature was brought together with controlled experimentation.
3. Development of a mechanistic world picture which tried to explain the workings of the natural world in nothing but corpuscles of matter in motion.
4. An uncommon appreciation of manual work, which led to the relative lowering of barriers between university-trained natural philosophers and artisans and craftsmen.

Undoubtedly, this revolution was made possible by a confluence of a multitude of earlier achievements of many civilizations—the ancient Greeks, Christianity, Islam, and through Islam, the contributions of ancient and classical India and China. Yet, the new science that emerged after the Scientific Revolution was most unlike any of the nature-knowledge traditions that went into it, including the Graeco-Roman and Judeo-Christian traditions that are the direct ancestors of Western civilization. While it took on board some elements of mathematical and observational stock of knowledge from earlier civilizations, modern science—the SaWKiT—turned the ancient cosmos and ancient methods of speculative reason upside down, and produced a new conception of the cosmos and humanity’s place in it.

So revolutionary and sweeping have the changes been that it is oxymoronic to say that any pre-modern knowledge tradition—be it Hindu, Christian, Islamic, Jewish, Buddhist, Taoist, or animistic—had the answer to the questions asked by modern scientists. Of course the nature of the natural world (its composition, the fundamental laws governing its operations) has not changed, but the conceptual categories, methodological criteria and the aims of inquiry have undergone such a radical transformation that it is safe to say with Thomas Kuhn that the ancients and the modern scientists practically live in different worlds.

If one accepts this picture of the birth of modern science, then the very idea of ancients having the answers that have emerged only in the last 500 years or so makes no sense. Of course, there are nuggets of useful empirical knowledge—the knowledge of useful medicinal plants, or organic methods of farming, for example—that can be incorporated

into the modern corpus provided they pass the stringent tests that all empirical claims must go through to be deemed “scientific.” Though beyond that, it is simply vainglorious to claim that modern science is only repeating what the ancients already knew.

Not only is the insistence of continuity between ancient and modern sciences unwarranted, it is entirely unproductive. The conviction that we have always-already known everything that is worth knowing, and that everything we knew is only confirmed—never rejected—by science, has prevented us from developing an ethos of honest inquiry. The compulsion to establish harmony with the core of the Vedic worldview has held back the progress of science in the past, and will continue to hold us back if we continue to go down this path. Admitting to being an ignoramus—Latin for “we don’t know”—is the first step toward acquiring knowledge.

Acknowledging that we do not have all the answers, and the answers we do have could well turn out to be all wrong, is what allowed modern science to emerge and flourish in Europe in the early modern era, from the 16th to the 18th century. It was not a matter of some special “Faustian Spirit” that existed only in the West, but rather a coming together of theological justifications for empiricism, political and mercantile interests, and technological breakthroughs along with a regard for manual labour that set the stage for the Scientific Revolution.

This process was by no means smooth. There was resistance from the Church and the Aristotelian professors who controlled the medieval universities. Yet eventually, an awareness emerged that the conclusions of the Greek philosophers (the earth-centred universe, the humoral theory of disease, Aristotle’s theory of falling objects) and the Bible (the seven-day Creation, the Great Flood) were incorrect as they failed to adequately explain the evidence obtained through systematic and increasingly precise observations and controlled experiments. Even though all the pioneers—Copernicus, Vesalius, Galileo, Newton and later, Darwin—were devout Christians working from within the traditional medieval view of the world derived from parts of Greek philosophy and the Bible, they managed to set a process in motion which ended up overturning the inherited framework.

What is even more important is that despite religious resistance, the scientific revolutionaries were not so compelled by the forces of tradition that they felt forced to “harmonize” their theories and methods with those prescribed by Aristotle and the Bible: Had that been the case, the new science would have died in its cradle. The Copernican theory of the sun-centred universe was not absorbed back into the ancient earth-centred universe of Ptolemy, nor was Darwin’s theory of natural selection contorted to make it appear as if it was in harmony with the Bible.

Despite initial condemnation on the part of religious forces, it was the bastions of tradition that had to capitulate to the force of evidence. (Yes, there are creationists among fundamentalist Christians who still believe in the literal truth of the creation story, but they are opposed by the mainstream of Christianity.) The metaphysical speculations of the early natural philosophers eventually had to give way to the experimental method, which involved precise measurement and quantification. In India, on the other hand, the

forces of tradition have managed to overpower and tame any idea that threatened to challenge the essential Vedic outlook of the primacy of consciousness, or spirit.

The history of Indian science abounds with examples of self-censorship by otherwise fine minds; whenever they perceived a contradiction between the Puranas (Sanskrit literature) and the mathematical astronomy of the Siddhantas (schools of Indian philosophy), for example, some of our well-known astronomers allowed the Puranas to overrule the Siddhantas. Disheartening examples include Brahmagupta in the 7th century opposing Aryabhata's theory of eclipses in favour of Rahu (a mythological severed head that causes eclipses by swallowing the sun) as well as Yajñeśvara Rode in the 17th century "crushing the contradictions" that Copernican astronomy posed to the Puranic worldview.

When confronted with conflicting arguments, our learned men did not stand up for what they knew to be true and backed by better evidence. For the most part, they chose to kneel before the Eternal Truths of Vedas and Puranas. The forces of conservatism and conformity have been so deeply entrenched in the system of rituals, social habits, and beliefs that govern our society, that our learned men did not have to be hauled up before an Inquisition (as Galileo was) to force them to renounce what they knew to be true—they did that willingly, on their own volition. The same compulsion to let the Vedas and Puranas have the last word is evident in how the torch-bearers of the Indian Renaissance co-opted scientific theories of physics and biology. The current crop of heritage-makers, including the Prime Minister and the academics who made the Science Congress so memorable are travelling down the road carved out by two of the most illustrious leaders of the Indian Renaissance, Swami Dayananda and Swami Vivekananda. Like the two swamis, they too are intent on picking out those modern scientific ideas and methods that they can then fuse with the Vedas and the Puranas.

If history is any guide, the rhetorical illusion of "harmony" between modern science and traditional views has only served the cause of the orthodoxy in India. Far from being a source of critical thinking that accepts that our holy books, our ancestors, and our traditions could be wrong; far from accepting that the old ways must be given up if they don't measure up to the best available evidence, this celebration of "harmony" has only co-opted science into religious dogmas. This road leads not to science, but to pseudoscience—whitewashing pet ideas to make them appear scientific.

Fabrication of heritage is, thus, a process of domesticating the past, turning it into stories that serve our purposes today. Presentism, or anachronism, is how the past is domesticated and history turned into heritage. Presentism means simply this: to see the past through the lens of the present. It has been called the "fallacy of *nunc pro tunc*" which is Latin for "now for then." In the history of science (and intellectual history more generally), presentism works by simply introducing contemporary conceptual categories and aims into the depictions of what the "scientists" of earlier epochs were trying to do. Professional historians are taught to recognize this fallacy of presentism and are trained to avoid it with all their might. "The past is a foreign country: they do things differently there" is the mantra of professional historians. The objective of history then becomes to study past ideas and practices within their own social-cultural milieu.

While historians shun presentism as best as they can, those who peddle heritage find it indispensable. The whole purpose of fabricating a heritage is to infuse the past with present meanings. This requires that the present be projected back into the past. For our purpose at hand—to understand how the history of science is saffronized—we have to understand how conceptual categories available to modern science (genetic science, quantum physics, nuclear energy and such) are read back into the minds of our ancestors. Presentist history is not just bad history; it is dangerous history as well, serving ethnic or fundamentalist ideologies.

The other major tool for fabricating a suitable heritage is to cordon off your own past from the rest of the world. I believe there is an absence of a serious and honest comparative perspective in the Hindu nationalist history of science. Or rather, to put a finer point on this statement, the comparative perspective is not entirely absent from their analysis, but it is deeply coloured by what can only be called a “Jagat-guru [guru of the world] complex”: invariably, India appears as the giver of science, but never a taker.

While this kind of history might be tonic for the Indian ego, it happens to be bad history. It is bad history for the same reason not stepping outside the boundary of your village limits what you can see and experience. It is bad history because it does not allow you to ask new and interesting questions about social and cultural differences that might have made a difference in the trajectories that science and technology followed in different societies. What I find even more distorting about this kind of Indo-centric historiography is that it fails to see and acknowledge how ideas cross national and cultural boundaries: circulation of ideas did not have to wait for the World Wide Web; it has been a part of human history from the very beginning.

I subscribe to what Joseph Needham used to call an *ecumenical view of the world*: The different civilizations did have scientific interchanges of great importance. It is surely quite clear by now that in the history of science and technology, the Old World must be thought of as a whole.

Once we see the Old World as an interconnected whole, we have no choice but to see our civilization as one among others bound to them by a mutual exchange of goods, people and ideas. Ideas were not always radiating from India to the rest of the world, but also coming into India from the rest of the world. Like every other sister civilization, we were givers and we were takers, with no monopoly on giving. Once we get over our complex and see India as one in a network of civilizations, a newer, more complex appreciation of India’s achievements will begin to take shape.

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