

## **Science and Education: The Sangh Parivar Assault**

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There has been considerable commentary in recent times, both in India and abroad, of changes being made in NCERT (National Council for Educational Research & Training) textbooks for middle- and high-school, particularly in history and political science, seeking to impose on young minds the deep-seated biases of the ruling party and its ideological, socio-cultural and political partners. NCERT textbooks are used not only by the Union Government's Central Board of Secondary Education (CBSE), but also by a dozen or so State Boards, and also have an overwhelming influence on school education in the country as a whole. Scholars and commentators have lambasted the deletion of entire chapters relating to rule by Mughals and other Muslim dynasties, the omission of any mention of linkages between right-wing Hindutva forces and Gandhi's assassination, the re-writing of the story of the early decades of independent India, whitewashing of the Gujarat anti-Muslim pogrom and so on. Critics have noted that NCERT, as well as government and ruling party spokespersons, have all hidden behind a fig leaf of "rationalization" of syllabi in view of the Covid pandemic and aiming to reduce the burden on students. It is patently obvious however that the changes made align with the communal and revisionist ideology of the ruling party and its socio-cultural partners.

Bar a few notable commentaries though, similar deletions and changes in science and mathematics textbooks have not received sufficient attention, although some prominent ones such as the deletion of Darwin's contribution to evolution theory have indeed attracted critical attention, again both at home and abroad. These changes are no less pernicious than those in history and political science, even if they are politically not so striking, and their social-ideological implications not so obvious.

This essay argues that these changes in the school curricula in science, maths and related subjects, with perhaps more to come, deserve closer examination. It is argued that they should not be seen in isolation, but as part of a series of interventions by the ruling party and Sangh Parivar affiliates in the field of science and scientific temper since the BJP came to power. It is further contended that these initiatives in school curricula, as well as similar on-going initiatives in higher education, mark a new, more ambitious BJP-Sangh gambit in the sciences. Whereas these developments need to be studied further, it is proposed that even on the basis of current evidence, these ventures should be seen as part of an effort to craft a more

broad based BJP-Sangh ideational world view that reaches beyond their traditional cultural-nationalist viewpoint.

A brief review of earlier BJP-Sangh Parivar moves on this front is in order.

### **Mythology as Science<sup>1</sup>**

Soon after coming into power in 2014, the BJP and the wider Sangh Parivar launched an, at that time, surprising and blatant attack on science and scientific temper. A series of statements by Ministers and high-ranking BJP and Sangh Parivar functionaries made all kinds of fanciful statements claiming fantastic scientific or technological achievements in ancient India, in particular in the Vedic-Sanskritic tradition, that too before anywhere else and sometimes even before known historical periods. Special sessions on the sidelines of the Indian Science Congress were held by persons sponsored by the Parivar, seeking to obtain reflected scientific authority by virtue of proximity to the powers that be as evidenced by their being part of the premier annual gathering of the scientific community in India, an event patronized by none other than the Prime Minister.

The Prime Minister himself, at an event in a Mumbai hospital, claimed that god Ganesha's elephant head fitting perfectly on a human body was testimony to the advanced cosmetic surgery known in ancient times. Other claims by BJP Ministers and other Sangh Parivar leaders included ancient India possessing a wide variety of advanced and sophisticated knowledge much earlier than the rest of human civilization, such as *in vitro* fertilization as evidenced in the Mahabharata by Kunti giving birth to Karna outside her womb, inter-planetary travel as far back as 7000 BC and, more recently, availability of the internet at the time of the Mahabharata and so on. Other spokespersons asserted that ancient India had theories "better than Einstein." These comments drew widespread criticism, even ridicule, from scientists in India and abroad, and also in the press.

If anyone thought the BJP or Sangh Parivar would be embarrassed by these episodes, or by what scientists including Nobel laureates, intellectuals and the global community would think of the BJP government, they were swiftly disabused of such notions. Completely unapologetic about their view of ancient science, senior BJP Ministers as well as BJP and Sangh Parivar leaders instead went on the offensive, making vitriolic attacks on anti-national "westernized" minds, "people who were ashamed of Indian history," and were "Macaulay putra," a Sangh Parivar pejorative for those educated in the "western system of education" in India. Defence of such views, untenable by the methods of science, also included that these were personal opinions of the persons concerned and scientists could disprove them if they so desired, that their very mention in ancient quasi-religious texts considered "itihisas" (histories) constitutes proof, etc.

Since these statements were being made by senior Ministers and Sangh Parivar functionaries, and not by some “fringe elements,” it was becoming clear that a concerted effort was being made to establish a new approach within the broader Hindutva ideological system, specifically a new perspective on science in ancient India and, at least by inference, on science itself. To be sure, such views were not unknown even earlier, and opinions of this kind had often and for long been voiced or written about by Sangh Parivar adherents, and continue to be available on several Sangh-proxy websites. But now these perspectives were coming out of the quasi-intellectual shadows into the public glare at the highest levels of government and the ruling party.

Taking these and other opinions expressed in speeches, essays in print or in online blogs, the major elements of this perspective could be discerned. First, the claim to antiquity, the idea that the Vedic-Sanskritic civilization and what the Parivar views as Hinduism’s Sanatana manifestation, perceived by them as coterminous with the Indian civilization, is the oldest in the world and that its corpus of knowledge, in this case of science and technology, were far in advance of that in other civilizations. It should be underlined that most of these claims of antiquity and the dates or period associated with them are unsupported by evidence or, at best, rely on mythological sources and supposition which others are expected to accept as evidence. Second, as this antiquity itself testifies, most of this knowledge was autochthonous, whereas much knowledge in other civilizations such as in the Middle East or Europe borrowed from India, often without acknowledgement. Third, that India would have retained this superiority had it not been for foreign conquest, domination and cultural suppression. Fourth, that the modern view in India and elsewhere regarding knowledge in ancient India, especially in science and technology, is a distorted, prejudiced and pro-Western outlook which deliberately belittles ancient Indian (read Vedic-Sanskritic) contributions and which has been cultivated and propagated in India by a Westernized, secular, mainly Leftist elite. Therefore, arguments against the veracity or historicity of Hindutva claims about ancient Vedic-Sanskritic knowledge are intrinsically suspect and may be discounted on those grounds alone.

Popular narratives along the above lines continued over the next several years, enthusiastically promoted by BJP-Sangh Parivar activists. Some slight toning down at the highest levels of the BJP Government may be perceived, possibly in view of the serious backlash in the scientific community in India and abroad, although fanciful claims have continued from middle-rung leaders from time to time.

## **Manufactured History and Pseudo-Science**

Various claims were also made supported by pseudo-scientific arguments or purported "scientific evidence" in support of modern BJP myths, fake news and social messaging. Examples abound such as the use of satellite imagery from the US National Aeronautics and Space Administration (NASA) showing a chain of shoals between Pamban island in India and Mannar island in Sri Lanka as "proof" of the existence of the mythical Ram Setu in the Ramayana according to which a bridge of rocks is built by followers of Hanuman to help the army of Rama to reach Lanka. Indeed, there are "rocks" there no doubt, but how is that proof that it is a constructed bridge as in the Ramayana legend? During the Covid pandemic, the Prime Minister called for people to come out on their balconies, light lamps and bang on pots and pans as a mark of community solidarity, mimicking similar demonstrations of solidarity during lockdowns under conditions of far stricter lockdowns and isolation in European cities. Within a day or two, social media was flooded by BJP supporters claiming that this collective show of lights could be seen from space, that space instruments could detect powerful radiation emanating from India which would have curative effects on Covid infections!

It may be noted parenthetically that this BJP-Sangh Parivar disdain for facts and evidence-based reasoning has also been evidence in many different spheres of governance and politics, not forgetting the faith-based claims made on the existence of a Ram temple on the site of the Babri mosque in Ayodhya. More recently, the BJP government has rejected evidence on the failure of demonetization to unearth black money, and also claims to have no data on excess deaths, deaths due to lack of oxygen or migrant deaths all during the Covid pandemic. Many reports by government or non-government institutions have been withdrawn or denied arguing that the methodology was flawed or being re-examined etc. This is all part of a broader schema according to which all information or data is twisted or manufactured to suit a pre-conceived narrative, and all contrary data or evidence cited is denied or sought to be discredited by any and all means.

These were another aspect of the BJP-Sangh Parivar assault on science and the scientific temper, that is, to make astounding claims and then advance seemingly scientific "evidence" to support these claims. As usual, criticism of these claims on grounds of lack of scientific or other credible evidence attracted counter-offensives based on adequacy of faith as evidence, anti-national bias of critics, or even solidity of the evidence advanced and demands that critics disprove it! Ironically, such pseudo-science, while undermining evidence-based reasoning by standing on its head the nature of evidence and how to test its veracity, also sought to rely

on “science” in whatever form, an acknowledgement of the respect with which science is held among the public.

The BJP-Sangh Parivar has not stopped shy of even manufacturing evidence to support its historical claims. Perhaps the best example includes the Sarasvati river which, legend has it, flows entirely underground and joins the Ganga and Yamuna at the Sangam or Prayag at Allahabad. A river Sarasvati may indeed have existed in the north-west of the Indian sub-continent, but has apparently disappeared due to ecological changes millennia ago. The BJP-Sangh Parivar insists the river is real, and have invented a whole “Sarasvati civilization” in North-West India around it so as to create an ancient Vedic-Hindu civilization to rival Harappan antiquity. All manner of evidence have been advanced such as “satellite imagery, geology, hydrodynamics, archaeology, epigraphy, textual hermeneutics, and DNA research”<sup>2</sup> in support of this claim, along with mythological and astrological “evidence,” liberally using inferences, extrapolations and suppositions to connect random dots, in what may be termed as a 1-plus-1-equals-4 approach. And now, to build up the case for this, the Union Government along with the Haryana and Himachal Pradesh governments, both then led by the BJP, have commenced work on a plan to “recreate” (read create) the Sarasvati River starting at a point called Adi Badri on the Haryana-HP border where a dam on the Som river in HP will be built to divert water into a dry river bed in Haryana to create a perennial stream along which tourist and pilgrimage spots would be built to bring mythology to life!<sup>3</sup>

Myriad “historical” claims on knowledge in ancient India, with an enormous variation in seriousness and rigour of evidence based arguments, are available on innumerable Hindutva websites, blogs and YouTube videos. Even a simple search of the internet will bring such expositions tumbling out, and all these efforts, including all the random statements by high BJP-Sangh Parivar functionaries, may be seen cumulatively as seeking to build a narrative of the Vedic-Sanskritic knowledge system being the most advanced, oldest and most superior knowledge system in human civilization, befitting the “vishwa guru” of the planet. It needs to be underlined, though, that this endeavour had hitherto been confined mostly to the popular domain with, at most, at least some appeal in the intellectually-inclined middle-class.

## **New Phase after NEP**

This essay argues that these endeavours have taken a major leap forward, and have entered a new phase, after the BJP-Sangh Parivar returned to power in 2019. With this, the BJP-Sangh Parivar moved aggressively towards institutional capture in various areas especially, of interest to this essay, in the education system. Besides executive action and political maneuver, the BJP moved to set in place the National Educational Policy

(NEP) first through a Draft “New Education Policy 2019,” and then through a revised NEP released in 2022. NEP has been widely criticized on a variety of grounds,<sup>4</sup> among other things for sharply increasing privatization and commercialization of education, withdrawal of the State from public education, cutting access in many ways to education especially for poorer rural and tribal children especially girls. NEP was also sharply criticized for being released without discussion in Parliament, for being imposed on States despite Education being on the Concurrent list constitutionally dividing powers between the Union and the States.

Using these powers, and manipulating executive authority, financially and administratively powerful Union Government institutions, and the Union Government bureaucracy working in the States, the BJP has also used the NEP to introduce major changes in the syllabi, curricula, text books, testing methods and institutions. These changes aim at systematically if gradually introducing Hindutva perspectives on Vedic-Sanskritic knowledge in ancient India and, increasingly, on science in general, into the education system at all levels. This would mainstream these perspectives and institutionalize their dissemination, not as opinions of a particular political-cultural organization or movement, but as societally established knowledge built in to the education system for transmission across generations. As further discussed below, these Hindutva perspectives on (mainly Vedic-Sanskritic) knowledge through Indian history, and on science in particular, are a work in progress, with many elements and aspects still evolving, even as some elements are considered “fully cooked” and therefore already being introduced into school syllabi and higher education courses.

### **Deletions in NCERT Textbooks<sup>5</sup>**

Against this background, we now examine some major deletions or modifications in NCERT textbooks as per information provided by NCERT itself.

#### ***Darwin deleted!*<sup>6</sup>**

As is well known by now, material on biological evolution has been removed from Class 9 and 10 science text books, and the earlier Chapter on Evolution and Heredity for Class 10 has been changed to a Chapter only on Heredity. Even a box on Darwin has been eliminated! Scientists and biologists in particular have been shocked by this decision which would mean that, students who would not go on to study biology in Classes 11 and 12 would not have any knowledge of evolution theory. Scholars have pointed out that, even for those who do not wish to study or specialize in the biological sciences later in life, evolution theory teaches students about the biological world around them, the relationships between living beings, and the importance of the natural world in creating and sustaining different forms of life. As such, it is a very important part of what all students should learn.

Scientists in India have therefore sharply criticized this move as a “travesty of education.”<sup>7</sup>

So what exactly is the Hindutva objection to Darwin and the theory of evolution and what does this tell us about the Hindutva worldview currently taking shape with regard to science.

Over the centuries, religious orthodoxy in several cultural-theological traditions with significant societal influence, have struggled with Darwin and the theory of evolution propounded in the mid-19<sup>th</sup> century, through the various stages of its development over several decades to follow. Christian orthodoxy in the West could not accept the Darwinian theory of evolution which postulated that all organisms evolved over time through changes in species in response to their environment, and that humans too had similarly evolved through different kinds of bipeds and hominids to homo sapiens. Despite much proof over many decades, and several modifications to improve the original idea in light of additional scientific research and evidence, including the all-important idea of mutations several decades after Darwin, religious orthodoxy could not deal with the challenge posed by the theory of evolution to ideas of “creationism” and literal interpretation of religious texts.<sup>8</sup> The Biblical idea that god created all living creatures at the same time, and especially that god created humans “in his own image,” clearly required that the Darwinian theory of evolution be rejected.

Whereas Europe has found a way to view Biblical creationism in a non-literal theological sense and thus avoid most conflicts in school, university and scientific research systems, the US today remains a hotbed of conflict on this issue, especially in States dominated by far-right Republicans and conservative evangelicals. Battles continue to be fought on whether Darwinian evolution should be taught in schools, including many court cases.<sup>9</sup>

Despite literal interpretations of Islamic texts in parts of West Asia, evolution had so far not emerged as a prominent theatre of conflict. Under pressure from orthodox theologians, however, teaching of Darwin and evolutionary biology has been banned in a few West Asian countries such as Saudi Arabia, Morocco, Oman and Algeria. Turkey however, which is undergoing deep socio-cultural changes and a resurgence of orthodoxy after a long period of secular modernism under Kemal Ataturk, recently banned the teaching of evolution from curricula at all levels, claiming that it is controversial and just another opinion. However, in much of the Islamic world, the dominant view including among many clerics, is that religion and science belong to different domains, the former for moral, spiritual and theological values, and the latter for discovery, innovation and improvement in the quality of life.<sup>10</sup>

Historically, there has never been such a debate either within Hindu religious sects or schools of thought or between Hindu religious orthodoxy and science as regards the theory of evolution. This is primarily because

there has never been an orthodox religious view of creationism in Hinduism to be taken literally or with which a conflict with scientific evolution theory could arise. That is until Hindutva came along and decided to oppose evolution theory, for some reason which this essay tries to fathom. At least one thing is clear, namely that since there is no basis in Hindu religion, and this underlines the fact that Hindutva is a socio-cultural-political movement rather than one with religious foundations. Suspicions of a Hindutva ideological motivation for the deletion of evolution from NCERT Class 10 text books have deepened as a result of statements to that effect by BJP-Sangh Parivar ideologues since these deletions came to light<sup>11</sup> and, in retrospect, similar statements made earlier.

In the context of Darwin and evolutionary biology, votaries of Hindutva have posited the *dashavatara* legend of the 10 avatars of the god Vishnu, as the "Hindu" view of evolution. Vishnu is said to have descended to earth in these different avatars in order to restore the cosmic order, first as matsya or fish, kurma or tortoise, varaha or boar, narasimha or half-man-half-lion, vamana or dwarf-god, parasurama or warrior-god and Krishna, the transcendent man-god. In most Puranic literature, these avatars are interpreted as ten stages in ascending consciousness. However, Hindutva votaries have started interpreting it as a theory of evolution, and one more element of ancient Indian (read Vedic-Sanskritic Hindu) knowledge that preceded its Western counterparts and was superior to them.

In 2019, the Vice Chancellor of Andhra University, addressing the 106<sup>th</sup> Indian Science Congress, stated that the Dashavatar gave a better theory of evolution than Darwin,<sup>12</sup> a view reiterated by a Vishwa Hindu Parishad official in a recent interview to Al Jazeera where he said that "the theory of Darwin has limited the scope of religion and that, being in the bloodstream of Hindus, it [dashavatar] must be taught in schools."<sup>13</sup>

Hindutva appears to have no problems with heredity, though, only with evolution. Heredity can be used, as Hindutva forces are trying hard to do, to somehow reiterate the indigenous origin of Aryans even arguing supposedly on the basis of genetics. Heredity suits notions of racial purity of some Indians, of the superiority of some castes, and nowadays, also the superiority and special properties of indigenous breeds of cattle! The former Minister of HRD repeated his earlier claims in Parliament in 2019 that Darwin's evolution theory was wrong, and that "it is our belief that we are descendents of sages (rishis)." Member of Parliament Kanimozhi representing anti-caste quasi-atheist DMP party retorted sharply to the many implicit notions of ethnic and upper-caste superiority in that statement saying, "my ancestors are not rishis... [but] human beings, and they were shudras!"<sup>14</sup>

The deletion of evolution is a great loss in more ways than one. As one expert on the text book committee put it, evolution is a bedrock scientific concept and helps students place many concepts in a larger context. It is

also an important way to “distinguish between ‘faith as a way of knowing,’ and ‘science as a way of knowing.’”

### ***Pythagoras is out too!***

Another change, somewhat puzzling to the casual observer, is that the proof of Pythagoras’ Theorem has been dropped from the NCERT Class 10 Mathematics textbook.

Historians of science have long known that many ancient cultures were familiar with what are called Pythagorean triplets --- such as 3, 4 and 5, wherein the sum of squares of the first two are equal to the square of the third ( $3^2 + 4^2 = 5^2$  or  $9+16=25$ ) --- most often encountered in right-angled triangles, and have used this knowledge in different applications especially in construction. The Greek philosopher Pythagoras (c.570-500 BCE) is usually credited with having been the first to generalize this as a theorem stating that the sum of squares on the two sides at right angles to each other is equal to the square of the hypotenuse i.e. the third side. Scholars and others genuinely interested in science and history, with a commitment to scientific methods, appreciate that the theorem, expressed, understood and “proved” in different forms, has been known in different ancient cultures over a period of several millennia, probably having been discovered independently of each other.<sup>15</sup> Nor does it really matter who discovered it first or where. However, those familiar with Hindutva writings aiming to prove antiquity and superiority of ancient Vedic-Sanskritic knowledge vis-à-vis Western science, would know that Hindutva ideologues have long been obsessed with asserting that ancient Indian mathematician Baudhayana (c.800-740 BCE?) had discovered and formulated this generalized theorem several centuries before Pythagoras.

Scholars in India and abroad have somewhat different opinions about when and where the theorem was discovered and articulated, but many are somewhat a bit divided on the exact translation of Baudhayana’s sulba sutra, although the later clarifications and explanations by the priest, mathematician and specialist builder of Vedic altars Apastamba (c.200-300 BCE?) makes it clear that Baudhayana’s formulation is the same as that of Pythagoras. Even the exact period when Baudhayana wrote his sutra is somewhat nebulous, as is often the case with ancient Indian sources, although most scholars are agreed that in all probability Baudhayana’s sutra dates from the early part of the first millennium BCE and in all probability pre-dates Pythagoras.<sup>16</sup>

As discussed later, it is one of the great tragedies, and failures, of Indian scholarship that so little is known definitively about the history of science in ancient India despite many efforts over the years. At the same time, the tendency of Hindutva ideologues to exaggerate their findings, jump to conclusions based on skimpy evidence and leaps across logical chasms, as

also the mostly poor level of scholarship among this cohort, have also led to deep suspicion of their claims.

In the case under discussion, even if Baudhayana had indeed authored the theorem before Pythagoras, why delete the latter's proof? Why not simply add a sentence to the effect that historical evidence points to this, and that several international experts also concur? One possible explanation is that such a drafting exercise has not yet taken place. Perhaps additional factors would have been taken into account too. First, Baudhayana does not provide any proof for his sutra or theorem, unlike Pythagoras. Second, Baudhayana provides only a geometric statement based on measurement of areas involved, without even providing a measurement of the diagonal of the rectangle he speaks of in the sutra.<sup>17</sup> Most probably, NCERT simply found it most expeditious, and politically most appropriate, to simply remove the proof and hence the name of Pythagoras.

### ***The Periodic Table***

Another curious but significant deletion, again in NCERT's Class X Science text book, is the deletion of the "Periodic Classification of Elements," that is, the Periodic Table as it is more commonly known. NCERT's reason, if pressed on the subject, would undoubtedly be that this revision is in pursuit of "rationalization" of the syllabus, lightening the load on students and conformity with NEP which is in line with these goals. However, the removal of important science subjects from the Class 10 syllabus, the last year that students who will not pursue science education after Class 10, as with the theory of evolution, is particularly concerning, about which more later. Even more troubling is the Hindutva-based selection of the topics being dropped, compelling a large section of students to pass out from school with a warped, ideologically-defined knowledge of important scientific topics which all students and citizens to know or at least know about.

The periodic table is a vital rung in the knowledge ladder of science, in which classification, here of elements, plays an important role in enabling further knowledge on properties of different elements and on methods of treating each substance. In physics or chemistry, knowledge had been growing about different distinct substances or elements, that is, the lowest form in which substances can exist (or be made) and which cannot be broken down further or changed into another substance, such as iron, gold, silver or oxygen. While other scientists too were coming close to more fully understanding the properties of these different elements and evolving a system of classification for them, Russian scientist Dmitri Mendeleev is usually credited with having evolved a "Periodic Law" according to which all elements can be arranged and their respective properties explained as per their atomic weight. Several decades later, with further understanding of the structure of atoms, the basis of this period separating one element from the next was amended from atomic weight to atomic number, namely the

number of protons in each element. This classification, along with later improvements, then enabled listing all elements, both naturally existing and manufactured, in the now familiar Periodic Table that could be neatly displayed on a single page or chart.

Now, when Mendeleev started to construct a table showing different elements known at that time, he was so confident of his periodic system of classification, that he left blank spaces for then unknown elements, and even predicted the atomic weights and properties of those elements which came true when these elements were soon discovered, enhancing his reputation and acting as further proof of his Periodic Law. Since Mendeleev did not know the name of these soon-to-be-discovered elements, he temporarily named them "Eka-Boron" and "Eka-Silicon," as also noted on the Class 10 NCERT Textbook, the names to be later substituted by scandium and germanium respectively. We learn from other texts that, like the "eka-" prefix from the Sanskrit for "one," the prefixes "dvi" and "tri" are also used for other hitherto unknown elements.<sup>18</sup>

This use of Sanskrit prefixes has come to be appropriated and utilized by Hindutva ideologues in their own unique way of stretching logic and drawing speculative analogies. A prominent long-standing ideologue has, for instance drawn a parallel between a posited two-dimensional arrangement of Panini's *sivasutra* or Sanskrit alphabet (*varnamala*) and the two-dimensional periodic table.<sup>19</sup> (The latter has rows in ascending order of atomic number and corresponding changing properties, and columns of elements separated by equal atomic numbers and showing similar properties as elements above and below it in the respective column, such as the highly reactive metals lithium, sodium, potassium in the first column and the also highly reactive halogen gases fluorine, chlorine, bromine, iodine in the last-but-one column, discounting the last column of inert gases). Even this author accepts that any direct connection between Panini's grammar and Mendeleev's periodic table is "unlikely," but suggests without further evidence that Mendeleev, by using Sanskrit, was "tipping his hat to Sanskrit grammarians" due to the "striking" similarities of the two-dimensional structures in both contexts!<sup>20</sup> For all we know, Mendeleev may well have used "alpha" and "beta" or "-1" and "-2," but chose to use Sanskrit prefixes for unknown reasons, one of which may have been that the study of Sanskrit had already gained wide acceptability and even high status in philosophical and intellectual circles in Europe of that time. Linguists and historians may examine further the veracity of the "two-dimensional" arrangement of the Sanskrit alphabet and Mendeleev's knowledge of it.

Not only is the use of Sanskrit by Mendeleev highlighted in the Class 10 Textbook as being something significant, the inclusion of Mendeleev's periodic table in a list of subjects to be covered under University Courses on "Indian Knowledge Systems" is another pointer to the Hindutva attempt to

make an issue out of this and utilize it as yet another piece of evidence of ancient Vedic-Sanskritic knowledge predating “Western” science.

### ***Political deletions in Science and Maths***

There are numerous other deletions and omissions in NCERT science and maths textbooks for Classes 6-12, especially till Class 10, after which Maths or the Sciences are pursued as specialized subjects only by some students. All these changes have been made in the name of “rationalization,” reducing the load on students, and conformity with the vision of the NEP, whatever that means. A comprehensive discussion of *all* these changes is far beyond the scope of this essay. Some salient points may, however, be discussed here, before taking up those omissions or deletions which appear to show a clear political motive, which is the main subject of this paper.

Certainly, omission or removal of some sections or even whole chapters for Classes 6-10 may be seen as lightening the load of students. Many educators question have, however, questioned the logic of dropping particular sections or chapters, and have argued that this weakens the capability of students taking up the science stream in senior years, by weakening their foundations in early classes. It also denies capabilities in a whole range of subjects for general students who may take up other subjects in senior secondary school or in higher education, or even for their working lives.<sup>21</sup> For instance, there is a consistent reduction or removal of sections or even whole chapters in Mathematics across Classes 6-10 in algebra, practical geometry, fractions and decimals, simple and compound interest, and even data handling and graphic depictions such as pie-charts, bar charts etc. Several sections even in Classes 11 and 12 in algebra, trigonometry, three-dimensional geometry and so on have also been deleted. The resulting lowering of standards in mathematics is strange when Indian students’ strength in mathematics is globally considered among their greatest assets. In Science too, many sections or chapters, for instance on food and water, diversity among animals and plants, metals and materials, industries etc have been dropped.

The educator cited above also argues that this aligns with “technocratic” NEP vision and goals by providing for skilled workers as defined by simplified standards and, by inference, leaving out non-science students from secondary education in these subjects.<sup>22</sup> This critique is debatable.

At least on paper, NEP sets great store by inter-disciplinary education at all levels. However, it is argued here, the non-exposure to science of non-science students will achieve the opposite effect. Perhaps more importantly, whether the authors of the NEP realize it or not, the contemporary work force requires a more rounded set of skills, including for science students, and even students not specializing in the sciences are required to have a reasonable knowledge of the sciences for many vocations whether in

manufacturing or services. The current “dumbing down” of science and math content in Classes 6 to 10 is doing great disservice to students.

Besides the above, a number of deletions of sections or chapters from general education, again in all Classes 6-10, can only be regarded as political, and cannot be explained away as “rationalizations.”

For instance, deletions of full chapters relating to the natural environment virtually in all classes, thus taking them out of the curriculum altogether, are incomprehensible. Full chapters have been dropped in Class 6 Science on where Food comes from, on Water, on Changes around us and on Waste, in Class 8 on Air and Water Pollution, in Class 9 Science on Natural Resources, and a chapter in Contemporary India-I Class 10 on Natural Vegetation and Wildlife: factors affecting flora and fauna. This at a time when environmental consciousness has finally begun to permeate into the education system and citizens’ lives, but also at a time when the natural environment is facing serious threats not seen since environment regulations began in India.

Again, how else can one explain deletions of Chapters in Class 7 Science on Climate and Weather and adaptation of animals, and on Winds, Storms, Cyclones, in Class 8 on Stars and the Solar System and on Minerals and Power Resources, in Class 9 on Climate: monsoons etc, and in Class 10 on Sustainable Management of Natural Resources and several sections from different Chapters under Contemporary India-II on Types of Resources, flora and fauna, environmental dangers in the Himalayas? Incidentally, a Chapter on the Solar System, the Moon and Geological time scales in Class 11 too has been dropped, meaning this topic is hardly being taught!

The claims that “rationalization” is being done, and that the above Chapters have been dropped because the topics being covered only for specializing students in Classes 11 and 12 are belied by sections or chapters dropped in Class 11 as well! Under India: Physical Environment in Class 11, large sections on Climate have been deleted, and a whole chapter on Natural Vegetation covering forest data, and the Nandadevi, Sunderbans and Nilgiri Biospheres has been dropped. In Class 12 Biology, whole sections under Ecology covering the carbon cycle, phosphorous cycle and ecosystem services have been dropped, along with an entire chapter on Environmental Issues!

How can anybody not see these deletions as anything but political moves by a government pushing a development-at-all costs agenda, riding roughshod on the ecosystem, and taking vindictive and punitive action against civil society organizations working on environmental issues?

A Chapter under Democratic Politics-II on Popular Struggles and Movements, mostly on environmental issues, has also been dropped. The only plausible explanation is that the ruling establishment does not want informed citizenry, that school children do not learn or think critically about

their environment, natural resources and damage being done to it, or even about weather and climate change.

A Class 10 Science Chapter on different Sources of Energy, and several sections from two chapters in Contemporary India-II on Agriculture (contribution to jobs, incomes and economy, and impact of globalization) and Manufacturing Industries (similar sections) have also been deleted. The deletion of a Class 9 Chapter on "Why do we fall ill" has also surprisingly been deleted, leaving one to speculate whether ayurvedic theories of wellness and balance of bodily fluids would later be substituted or added as alternative theories!

Other deletions include a Chapter on India after Independence under Our Pasts-III in Class 8, various sections dealing with caste and other issues in two chapters on Marginalization under Social & Political Life in Class 9, another full Chapter under Contemporary India-I on Population and related factors in Class 9, and two Chapters under Democratic Politics-II in Class 10 on Political Parties and on Challenges to Democracy.

Even for seniors in Class 11 Themes in World History, whole chapters on Central Islamic Lands and the Industrial Revolution have been dropped! Under Human Ecology and Family Sciences, there has been a wholesale massacre of important topics such as the Family, Significant Others, work/workers/workplace and as many as 5 chapters on Individual Rights and Responsibilities have disappeared!

These deletions complete the picture of a new school system designed to ensure that students are uninformed or poorly informed on major issues in science, social and political life, particularly as regards issues in which the ruling establishment would much prefer that future citizens of the country do not get involved, leaving a space to be filled by a centralizing, Hindutva ideology-driven authoritarian state.

### **Some thoughts on higher education**

It may surprise readers that this essay is being drawn to a close without discussing developments in higher education. There are many reasons, chief among them being limitations of space.

Discussion of on-going, proposed and yet unknown Hindutva interventions in higher education would take a long time and occupy perhaps more space than the present essay focusing on school education. Even the on-going interventions in higher education would call for detailed discussion across a wide range of disciplines including philosophy, linguistics, mathematics, astronomy, the sciences (mostly physics), health and medicine (including surgery), architecture (including town planning, vaastu), technology (including materials, metallurgy), and so on, each with a fairly vast syllabus.

Numerous elective courses in "Indian Knowledge Systems" (IKS) as outlined above are now to be compulsory for up to 5 percent of credits

towards an under-graduate degree.<sup>23</sup> As may be imagined, these new courses and their curricula have involved preparation of new text books, training material for teachers and other inputs<sup>24</sup> from many academics and special centres set up at premiere institutions such as IIT Kharagpur. These are non-trivial material, very different from the off-the-cuff, fantastic "ancient Indian science" earlier claimed and projected by Government and Sangh Parivar leaders. Nor are they simply deletions of sections and chapters in school, however significant these may be.

The IKS content is a purportedly holistic view of an entire civilizational construct revolving around Vedic-Sanskritic knowledge across different streams. Its aim is not only to showcase ancient knowledge in a substantial part of the Indic civilization, but is also a project avowedly undertaken by the Sangh Parivar to decolonize the Indian educational system and bring back to life earlier knowledge in India which had not been accomplished or attempted except under its "cultural nationalism." The Sangh Parivar projects as if it has uniquely "discovered" this lacuna and is making efforts to rectify it. It needs to be underlined that the rediscovery of knowledge in ancient India and in different periods goes back over two centuries when the growing anti-colonial struggle required showing the Europeans that Indian thought and civilization was equal if not superior to theirs, and to debunk the "civilizing" mission of the colonizers. Nor was India alone in such an endeavour, most anti-colonial movements having gone through the same, so much so that sociologists and historians have come up with a term for it: "ancientization"!

Many efforts were in fact made in post-Independence India under the "Nehruvian State" to systematically study and document knowledge in ancient India. For instance, a History of Science board was formed within the Asiatic Society, which then transformed into the National Commission for Compilation of History of Science in India in 1965, and then into the Indian National Commission for History of Science in 1989.<sup>25 26</sup>

Among others, the work of D.D.Kosambi, D.P.Chattopadhyaya, J.B.S.Haldane, J.D.Bernal, Joseph Needham, incidentally all Marxist scholars, is noteworthy in this regard. It must be admitted, however, that this exercise has remained inadequate, with much ground left to be covered.

A detailed critique of the Sangh Parivar's IKS exercise could well be a part of such an exercise, because the BJP-Sangh IKS, for all its quasi-scholarly attempts to appear historically and scientifically rigorous, suffers from major structural deficiencies in both.

Firstly, its dating of various ancient Indian scholars remains problematic, although less so than the imaginary projections of some ideologues as witnessed earlier. For all its purported rigour, BJP-Sangh IKS material being disseminated leaves the door open for the Vedic period to stretch back in time as far back as may be imagined so as to claim the stature of being the first to discover all new knowledge. Secondly, while this

IKS literature speaks extensively of how knowledge from India flowed to other countries, it does not at all acknowledge the reverse flow of knowledge from Greece, China, the Arabic, Persian or Turkic-speaking, which is known to have occurred. This failure shows the “Hindu knowledge system” and its claim to superiority in poor light, since other civilizations have been more generous in acknowledging Indian contributions, such as Al Khwarizmi, who brought algebra to world attention and acknowledged Indian primacy,<sup>27</sup> and the fact that the Arabic translation around 800 CE of the Sushruta Samhita is named *Kitab-i-susrud*. Thirdly, while seeking to assiduously document early knowledge from Sanskrit texts, there is no attempt to unpack reasons for stagnation or decline or failure to grow further, which is as important as how knowledge grew. Of course, restricting Indian knowledge to the Vedic-Sanskritic traditions, despite some token recognition of contributions from Jaina and Buddhist traditions, not only betrays the BJP-Sangh communal vision, it wrongly restricts the scope of knowledge in pre-colonial India, especially in medieval times. All these are both unscientific and a-historical.

A more detailed examination and critique will have to await another essay!

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<sup>1</sup> This Section borrows liberally from D.Raghuandan, “Science, history and mythology,” Vikalp, at <https://vikalp.ind.in/2015/02/science-history-and-mythology-hindutva/>

<sup>2</sup> <https://garudabooks.com/the-sarasvati-civilisation>, Blurb of G.D.Bakshi, “The Sarasvati Civilization,” Garuda Books

<sup>3</sup> <https://indianexpress.com/article/india/haryana-himachal-mou-saraswati-river-revival-7732551/>

<sup>4</sup> “CPI(M) response to New Education Policy,” Peoples Democracy, 9 August 2020 in [https://peoplesdemocracy.in/2020/0809\\_pd/cpim-response-new-education-policy-2020-nep](https://peoplesdemocracy.in/2020/0809_pd/cpim-response-new-education-policy-2020-nep)

<sup>5</sup> All information about NCERT Textbooks given in this section are based on information provided by NCERT itself in <https://ncert.nic.in/rationalised-content.php>

<sup>6</sup> This sub-section has substantially drawn on Raghu, “NCERT textbook revisions,” Peoples Democracy, 23 April, 2023 in [https://peoplesdemocracy.in/2023/0423\\_pd/ncert-textbook-revisions-science-target-too](https://peoplesdemocracy.in/2023/0423_pd/ncert-textbook-revisions-science-target-too)

<sup>7</sup> See <https://theprint.in/india/education/science-community-slams-ncerts-move-to-delete-darwins-theory-of-evolution-from-books-travesty-of-education/1533309/>

<sup>8</sup> “Darwin and his theory of evolution,” Pew Research Centre, 2009, available at <https://www.pewresearch.org/religion/2009/02/04/darwin-and-his-theory-of-evolution/#:~:text=Darwin's%20notion%20that%20existing%20species,the%20biblical%20book%20of%20Genesis.>

<sup>9</sup> “Darwin in America: the evolution debate I the United State,” Pew Research Centre, 2019, available at <https://www.pewresearch.org/religion/2019/02/06/darwin-in-america-2/>

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- <sup>10</sup> Mohammad Alassiri, "Evolution is the disguised friend of Islam," *Nature Human Behaviour*, 4,122, 23 October 2019, available at <https://www.nature.com/articles/s41562-019-0771-7>
- <sup>11</sup> See, for instance a debate on television available at <https://www.ndtv.com/video/shows/ndtv-special-ndtv-24x7/the-darwin-debate-theory-of-omission-evolution-of-a-controversy-696075>
- <sup>12</sup> See <https://indianexpress.com/article/india/dashtavar-better-theory-evolution-andhra-university-vc-5524605/>
- <sup>13</sup> See <https://www.aljazeera.com/news/2023/4/14/mughals-rss-evolution-outrage-as-india-edits-school-textbooks>
- <sup>14</sup> See <https://timesofindia.indiatimes.com/india/bjp-mp-again-questions-darwins-theory-says-human-beings-descendants-of-sages-not-monkeys/articleshow/70298684.cms>
- <sup>15</sup> See, for example, History of Mathematics Project, New York Museum, available at <https://www.history-of-mathematics.org/PythagoreanTheorem.html>
- <sup>16</sup> See a critical review of S.Balachandra Rao, "Indian mathematics and astronomy: some landmarks," Jnana Deel Publications, Bangalore, 1994 and several other works by different Indian and international authors in <https://www.cse.iitk.ac.in/users/amit/books/rao-1994-indian-mathematics-astronomy.html>
- <sup>17</sup> Ibid.
- <sup>18</sup> "How Sanskrit led to the creation of Mendeleev's periodic table," Subhas Kak, *Swarajya*, February 2015, at <https://swarajyamag.com/books/sanskrit-and-mendeleevs-periodic-table-of-elements>
- <sup>19</sup> Ibid
- <sup>20</sup> Ibid
- <sup>21</sup> Sanjay Kumar, "Design or hack job? Evolution and periodic table scrapped," Newslick, 15 June 2023, at <https://www.newslick.in/design-or-hack-job-evolution-and-periodic-table-scrapped>
- <sup>22</sup> Ibid
- <sup>23</sup> Draft Guidelines for incorporating Indian Knowledge Systems in Higher Education," University Grants Commission in [https://www.ugc.gov.in/pdfnews/3226446\\_Draft-Guidelines-for-Incorporating-Indian-Knowledge-System-in-Higher-Education-Curricula.pdf](https://www.ugc.gov.in/pdfnews/3226446_Draft-Guidelines-for-Incorporating-Indian-Knowledge-System-in-Higher-Education-Curricula.pdf)
- <sup>24</sup> "Guidelines for Training of faculty in Indian knowledge Systems," in [https://www.ugc.gov.in/pdfnews/5855891\\_Guidelines-for-Indian-Knowledge-System.pdf](https://www.ugc.gov.in/pdfnews/5855891_Guidelines-for-Indian-Knowledge-System.pdf)
- <sup>25</sup> Akshat Rathi, "Separating fact from Indian science fiction," Live Mint, 1 August 2015, available at [https://www.google.com/search?q=live+mint+history+of+science+India&rlz=1C1ONGR\\_enIN1052IN1052&oq=live+mint+history+of+science+India&gs\\_lcrp=EgZjaHJvbWUyBggAEEUYOTIJCAEQIRgKGKABMgkIAhAhGAoYoAHSAQ4zNDYxNDY2OTdqMGoxNagCALACAA&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=live+mint+history+of+science+India&rlz=1C1ONGR_enIN1052IN1052&oq=live+mint+history+of+science+India&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIJCAEQIRgKGKABMgkIAhAhGAoYoAHSAQ4zNDYxNDY2OTdqMGoxNagCALACAA&sourceid=chrome&ie=UTF-8)
- <sup>26</sup> See Indian National Science Academy at [https://insaindia.res.in/?page\\_id=1033#:~:text=A%20C%20Ukil%2C%20with%20an%20aim,Commission%20for%20History%20of%20Science%E2%80%9D.](https://insaindia.res.in/?page_id=1033#:~:text=A%20C%20Ukil%2C%20with%20an%20aim,Commission%20for%20History%20of%20Science%E2%80%9D.)
- <sup>27</sup> J.D.Bernal, *Science in History*, Vol-I, p276