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ARTICLE

Science and Knowledge as a Tool of Subjugation
Perspectives of European Colonialism in India

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ABSTRACT

The development of science as an integral part of society is evolutionary and goes hand in hand with the prosperity of the human intellect, resources available and the freedom accorded the society to think and prosper. India's scientific heritage had reached its pinnacle in its own perspectives that are difficult to compare with western philosophy and thinking. The underpinning of India-centric eastern philosophies that knowledge i.e. truth can be approached by diverse means had epistemologically led to the evolutionof wide array of methodologies and inculcation of multidisciplinary learning processes in India's indigenous education system. Hence science has historically been an inevitable aspect of India's education curriculum since the ancient and medieval periods. Though the Islamic invasions and European colonisation of the Indian sub-continent during the medieval period were resisted, they had caused tantrums in the regular and active functioning of society and had therefore disrupted societal components such as education, economy and trade, culture, polity, agriculture, taxation system, etc. as there had been various external factors and tools such as colonisation, imperialism, mercantilism, exploitation, monopolistic trade, loot, slavery, inquisitions, violence, genocide, etc. that influenced the internal affairs thereby causing subjugation of the Indian minds.

The pursuit of science and technology as a tool with an unethical intention to subjugate the Indian sub-continent and its polity has been explored in this paper. The introduction of the telegraph, railways and steam ships as a means of faster

communication and transportation for militaristic, political and trade purposes proves that scientific superiority wasalso a means of subjugation by the European colonial powers, particularly the British. The paper also explores how the distortion of history, unethical misappropriation of India's knowledge systems and dismantling of indigenous education concepts and structures such as gurukulas and patshalas by cutting off rural financial mechanisms through the adverse taxation system and the introductionof urban-based western education system had ultimately led to the subjugation of India's national conscience.

Keywords: Indigenous Knowledge Systems, Gurukulas, Philosophy, Mahatma Gandhi, Rabindranath Tagore, Dharampal, European Colonialism, Renaissance

Introduction

The subject of science enables expansion and refinement of knowledge through critical investigation and understanding of our surroundings by posing questions (Mukhopadhyay & Bhattacharya, 2014). Science indeed influences socio-economic development due to the interlinked relationship between science and society. Hence science and technology as policy measure is crucial for governance and plays an important role in the overall and long-term development of society and the nation (Sikka, 2012). Traditionally and culturally India has given importance to the various knowledge systems such as theology, literature, grammar, philosophy, arts, ethics and science thereby evolving as a multidisciplinary educational structure imparted through the Gurukula system of collective education that had its foundation in oral transmission and dissemination of knowledge (Scharfe, 2018). Such a system of education was considered sacred and visibly seen as a socio-cultural phenomenon across the Indian sub-continent during ancient and medieval times. As a result, India has an uninterrupted and well-documented socio-political and scientific history of over 5000 years as a part of its cultural heritage (Bhargava & Chakrabarti, 2003).

It is a fallacy that the evolution of science is thoroughly credited either to the ancient Greek civilisation or the modern western civilisation without recognising the contributions of Asian scientific and technological nations, particularly India. This false idea of scientific foundations that were laid in the west has been dumped into India's national conscience since the

colonial endeavours of the Portuguese, till that of the British and thereafter. India's scientific knowledge engraved in different languages such as Sanskrit, Tamil, Pali, Arabic, Persian, Malayalam and other languages and dialects is evident of the scientific culture and heritage of India. India was perceived as a land of knowledge and wealth as is evident from numerous traders and scholars travelling to India during the ancient and medieval times. The accidental founding of the Americas by Nicolas Columbus, while in vigorous pursuit of discovering the Indian mainland, and Vasco da Gama's arrival via sea to Calicut in Kerala are but the two testimonies that 15th century Europe aspired to trade, prosper and shine like India. (Rahman, 1984)

The study of the history of science in India is a crucial area of study to understand the influence of science in the development of societies, civilisations and how they were subjugated, robbed, colonised and the manipulation of their knowledge systems by foreign civilisations through the instrument of colonialism that was at the behest of scientific superiority. The development of modern science in Europe was made possible with the original contributions from India's knowledge systems till the 12th Century AD and later (Biswas, 1969). Prof. MacDonnell in his book titled *A History of Sanskrit Literature*, observes: "The debt of Europe to India has been considerable. There is in the first place, the great fact that the Indians invented the numerical figures used all over the world. The influence that the decimal system has had, not only on mathematics but on the progress of civilization in general. During the eighth and ninth centuries, the Indians became the teachers in arithmetic and algebra to the Arabs, and through them to the nations of the west"(Macdonell, 1900). With a consistent socio-cultural and economic vibrancy along with tremendous scientific achievements in the fields of chemistry and metallurgy, physics and earth sciences, mathematics and astronomy, medicine, agriculture and animal sciences, engineering science and other disciplines of arts and religion, how did India ultimately get subjugated by European colonialism over the centuries to the extent of causing socio-cultural degradation? Through Islamic invasions and European colonialism India was strategically yet steadily displaced from a stage of the consistent performer through subjugation.

The paper explores the strategic yet systematic ways that led to the political subjugation of an entire sub-continent that was not entirely by aggression but also through the subjugation of the minds by the colonisers. Only a few thousand of European soldiers were indeed present in the Indian subcontinent. However, through various policies of the British East India Company and later on of the British Crown there was erosion in the social and cultural system such as education, agriculture, trade, etc. It was these happenings, that can be defined as 'rustling of hornet's nest', that had enabled the European colonisers, particularly the British to penetrate the national conscience of the Indian subcontinent. The dismantling of the indigenous education system and infrastructure such as the *gurukula* and *patshala* in the rural and interior areas to intentionally replace them with the western system of education forms a major setback in the history of Indian education. Another strategy of the British was the distortion of the intellect and history of the knowledge evolution through intellectual theft of Indic achievements in science and technology.

The paper also discusses how such manipulations led to the false claims of the western scientific and technological superiority of the colonising forces thereby resulting in the subjugation of the masses that created a dilemma among the population of India thereby paving way for political subjugation over a period of time.

Subjugation of Indigenous Education and Knowledge Systems

The educational legacy tradition of *gurukulas* or centres of higher learning in ancient India had gradually evolved into renowned universities such as the Takshashila (in Gandhara); Nalanda, Odantapuri, Vikramshila and Telhara in Bihar; Sharada Peeth Temple University in Kashmir; Vallabhi in Gujarat; Pushpagiri in Odisha, Somapura, Bikrampur and Jagaddala in modern Bangladesh; Morena in Madhya Pradesh; Kanthaloor Sala in Keeladi, Tamilnadu; Nadia in Bengal; apart from others and imparted multidisciplinary education in diverse fields since ancient times even to those scholars arriving from other countries (M. Sinha, 2019). The medieval Islamic invasion and physical destruction of educational facilities and universities that

differed from Islamic thought was the foremost incidence of intellectual subjugation by force and bloodshed that India faced as early as the 11th century AD. The burning of manuscripts in the Nalanda University by Bhakhtiyar Khilji in 1194 AD is an unforgivable example.

The western explorers and traders from Europe who started arriving in India from 1500 AD onwards were totally alien to the Indian culture, tradition and philosophy. As time passed the economic interests of these European companies started to become political and imperial. With this intention the European nations particularly the British empire started to study everything that was Indian through extensive surveys. The British also made a detailed understanding of the geography, minerals, agriculture, flora, fauna, and topographical and demographical features of India for a better understanding of the resources (R.D. Roy, 1982). The traditional and indigenous education systems such as the gurukulas, patshalas and madrassas were also surveyed in order to better understand the foundational characteristics of the Indian subcontinent. The British survey in 1862 of the Madras Presidency ordered by Thomas Munro and Adam's report on a survey of education in Bengal between 1836 and 1838 reveal that every village in Madras and Bengal presidencies had a school. The reports also reveal a sizeable number of institutions of higher learning, scholars and medical practitioners. The 1882 survey on the '*History of Education in the Panjab Since Annexation*' by Dr G.W. Leitner reveals how the British caused irrecoverable degradation to the indigenous education system in Punjab after its annexation causing crippling and destruction of the indigenous education system in the name of educational upgradation. Dr Leitner writes: "Respect for learning has always been the redeeming future of 'the East'. To this, Punjab formed no exception. We have changed all this. The annexation disturbed the minds of believers... and the true education of Punjab was crippled, checked and is nearly destroyed". (Dharampal, 1983).

Various reports on the state of education after the beginning of British rule in India show how neglect was accorded to indigenous education causing its decay. The British to establish a western model of education attempted to eliminate indigenous

knowledge systems in India. About the diminished state of indigenous education in India, Mahatma Gandhi spoke at the Royal Institute of International Affairs at Chatham House in London on October 20, 1931. Gandhi said: "I say without fear of my figures being challenged successfully, that today India is more illiterate than it was fifty or hundred years ago, and so is Burma, because the British administrators, when they came to India, instead of taking hold of things as they were, began to root them out. They scratched the soil and began to look at the root, and left the root like that, and the beautiful tree perished… There are statistics left by a British administrator which show that, in places where they have carried out a survey, ancient schools have gone by the board, because there was no recognition for these schools, and the schools established after the European pattern were too expensive for the people, and therefore they could not possibly overtake the thing… This very poor country of mine is very ill able to sustain such an expensive method of education. Our state would revive the old age village schoolmaster and dot every village with a school both for boys and girls." (Dharampal, 1983).

Gandhi relied on two articles published in *Young India* in 1920 by Daulat Ram Gupta titled 'The Decline of Mass Education in India' and 'How Indian Education was Crushed in the Panjab 1849-1886'. The articles emphasised on the British attempting to establish a western education system that was alien to the education culture of India wherein religions revered education and therefore had a school attached to their temples and mosques with their own methods and syllabus of education that aptly suited the local language and socio-cultural paradigm. The British attempted to establish government schools on western lines and totally neglected the indigenous schooling system. With a lack of funds and endowments from the local guilds, the indigenous education system was left to face a slow death thereby enabling the British to establish the western model of education. The British made prolonged attempts to change the intellectual capacity of Indians and recourse on lines with western thinking by diluting the indigenous practices and thought processes to create a new education system in India to

meet British colonial needs and demands (Balagangadhara, 1994).

Subjugation through Knowledge Theft and Distortion of History

Thomas Babington Macaulay in his 2 February 1835 speech says: "We must at present do our best to form a class who may be interpreters between us and the millions whom we govern, a class of persons Indian in blood and colour, but English in tastes, in opinions, in morals and in intellect. To that class we may leave it to refine the vernacular dialects of the country, enrich those dialects with terms of science borrowed from the Western nomenclature, and render them by degrees fit vehicles for conveying knowledge to the great mass of the population"(Macaulay, 1835). Contrary to what Macaulay had said in his speech, Charles M. Wish, a British Civil Servant, had earlier in the year 1832 presented in Britain the Sanskrit treatises of *Tantrasamgraham*, *Yuktibhasha*, *Karanapaddhati* and *Sadratnamala* from southern India that had many kinds of infinite series that were equivalent to the calculus. Charles M.Wish states that these texts contained the Indian works on astronomy and mathematics dating between the 5^{th}-15^{th} centuries AD. The truth emerged about how the Indian calculus by Nilakantha Somayaji (1501 AD) was copied and transmitted by the Jesuit priests of Cochin to the church functionaries in Europe back in the 16th century for navigational purposes, which later emerged as Newtonian physics, and very importantly, as to how Copernicus, a priest, copied from the astronomical works of Nasir ud din Tusi of Maragha and Idn Shatir of Damascus (1375 AD) without any acknowledgement of the Islamic sources (Raju, 2009).

Macaulay's ignorance of the Indological perspectives and Indian achievements of science and technology are deep-rooted in the western religious motive of thwarting alternative and indigenous scientific ideas and thoughts that are in direct contradiction with the views of the Christian church, particularly with respect to the cyclic phenomenon of the eternal philosophical concepts of time and cosmos (Raju, 2006, 2013). This is due to the direct contradictions of the pagan cultures for

the beginning of Christianity with regard to its time and other philosophies such as the doctrine of creation and ethics. Hence the western colonial powers chose subjugation of intellectuality and alternative ideas on one side and misappropriation of knowledge as a viable method of colonisation as compared to militaristic methods. This is exactly what Thomas Babington Macaulay spoke of in 1847 at the House of Commons: to provide education of the church to the poor, who on the verge of a revolution, tend to dissent or rebel against the ruler. Macaulay said doing this was the simplest way to prevent a revolution from happening rather than thwarting those who revolted (Macaulay, n.d.).

It would be wrong to only blame the British for their European counterparts such as the Portuguese, Dutch, Danes, French too had subjugated parts of the Indian sub-continent through imperialism, mercantilism, cash crop cultivation, monopolistic trade, extensive taxations, exploitation, loot, treachery, slavery, brutal violence, genocide and church-sponsored inquisitions and conversion in asserting colonial powers and distorting Indian history(Hoffenberg, 1998). The sheer conviction that science and technology had a strong link for the gain of political power as it gave cutting-edge advantages in production, destruction and generation of wealth made the British see science as a means of colonial power and establish political supremacy in Asia, Africa and the South Pacific regions that supported the fledgling industrial revolution back in Britain (Kumar, 1995).

Subjugation, Science, Technology, Ethics and Sustainability

It would be logical to say that British imperialism was itself a byproduct of science and technological development post the European Renaissance. Primarily the steam-based transportation systems such as steam-based water vessels and steam rails enabled faster communication transportation of goods, military and personnel from Europe to the Indian mainland and within India thereby pushing colonial requirements and interests with great fervour. The railways enabled the transportation of minerals and raw materials from the interiors of India to the seaport from where they were sent to Europe.

The British's introduction of the electric telegraph in India enabled rapid communication as it strategically connected important stations within a very less time. The Indo-European telegraph operation that was erected by the Siemens brothers between 1870 and 1930 stretched over 8,300 km and strategically connected Calcutta with London, Geneva, Budapest, Prague, Petersburg, Paris, Stockholm, Berlin, Vienna, Oslo, New York and Rome and had spread across 34 countries (Karbelashvili, 1991).Very well before the First War of Indian Independence in 1857, the British East India Company could communicate and connect using the telegraph from Calcutta to Benares (Varanasi), Prayagraj, Ambala, Agra, Peshawar and Lahore in short intervals and this enabled rapid sharing of vital information that was related to military intelligence (Rahman, 1984).

It is beyond doubt that the advancement achieved in science and technology is directly related to the per capita and national income of any nation based on the current model of economic development as it is innovation-driven with technology at its core. At the same time, insufficient precautions and uncontrolled application of technology have also created serious challenges, like air and water pollution among others (Dagli, 1982). Mahatma Gandhi's criticism of the Western model of unsustainable development that resulted from science and technological intervention of the West when compared to India's indigenous sciences, traditional heritage and cultural values that aimed at sustainability is notable in the sense that such a comparison led to the evolving of 'Swadeshi Movement' and call for *poornaswaraj* or *swatantra* (self-rule) against British colonialism (J. Sinha, 2004). Indigenous technology, which had sustainable concepts as its core, was patronised as a part of the national independence movement, and efforts were made to use and develop the age-old indigenous technology without giving way to the imported technology of the Industrial Revolution era (Rahman, 1984).

Gandhi considered 'science without humanity' as a sin and criticised the industrial engineering that was introduced by the British as it was resource intensive, unethical, exploitative was used as a tool for subjugation ('Mahatma Gandhi and Sustainable Science', 2019; *The Collected Works Of Mahatma*

Gandhi, Volume 28 (August - November 1925), 1968). Gandhi's view of 'science without humanity' impresses the fact that 'if science becomes all technique and technology, it quickly degenerates into man against humanity' and therefore shall be subject to subjugation(Covey, 1991). Therefore Gandhi resisted colonial science and its philosophies of subjugation to revoke the spirit of *swadeshi* by portraying *charkha* as a mass instrument of the non-cooperation movement thereby emphasising on sustainable industrialisation and resistance against the British colonialist-capitalistic expansionism (Prasad, 2001).

Similarly, Rabindranath Tagore too criticised the modern science of the West for being resource exploitative and having destructive and subjugative tendencies by imposing colonialism through technological superiority to attain power and wealth while restricting human freedom and equality (K. Roy, 2010). Being a renowned philosopher himself, Tagore had categorically said that such vested interest had lacked ethics and had also created conflict between science and the very nature of human beings, i.e., seeking spiritual truth (M. Roy, 2016). Tagore believed that such an unethical practice of science could be removed only through the decolonisation of education that was implanted by British imperialism, which had crept deep into the Indian system of education. To this effect, Tagore established the Shantiniketan school and the Visvabharati University to decolonise education through the imbibing of indigenous intellectual fervour (Mukherjee, 2021).

Conclusion

The essence of scientific spirit is the integral result of the vibrant academic and intellectual capacity of a nation. The ability to innovate and invent technological expertise is but the result of the collective or individualistic intellectual capacity of people to judiciously utilise available resources in accordance with an existing statement of the problem that is representative of demand or necessity for a solution on technical lines. However, philosophy of science forms the foundational basis of scientific methodology and epistemology in all cases.

The inability of the Islamic invaders and European colonisers, particularly Britain, to understand that there are numerous ways

and methods for the realisation of the truth, both in the sense of knowledge, religion and spiritual absolute made it possible for them to consider the replacement of eastern civilisations practising diverse thoughts and practices with that of western thoughts such as Islam and Christianity through invasions, colonialism and subjugation. The physical destruction of educational facilities and universities during the Islamic invasion and the strategic dismantling of Indigenous education systems such as gurukulas and patshalas to assertively replace them with a western model of the education system by establishing schools in urban areas had greatly affected the rural intellectual infrastructure thereby leading to its dilution and gradual death.

In this regard, the European Renaissance and Industrial Revolution in Britain widened the scope of science and technology as a means of subjugation of the intellectual arena and gradually the polity of the Indian subcontinent. How technological inventions such as the telegraph, railways, steam engines and industrial equipment of mass production were unethically used for trade, military, transportation, communication, etc. that resulted in the colonisation and subjugation of India are already known. India's independence movement and political stalwarts such as Mahatma Gandhi and Rabindra nath Tagore had thus resultantly criticised the unethical instincts of the western model of development imposed by the British that had hazardously used science as a means of subjugation and exploitation.

Gandhi's criticism of resource-intensive and unsustainable industrial development as a result of technological intervention made him postulate 'science without humanity' as a sin and led him to counter such unethical measures of the British with an indigenous model of sustainable development. His highlighting of *charkha* as a symbol of non-cooperation and indigenous resistance demanding *poorna swaraj* against British colonialism was but on the lines of sustainable development. Gandhi's resistance to science with the colonial mentality and capitalistic expansionistic traits was on ethical and humanitarian grounds. Similarly, Tagore's criticism of modern science from the perspective of its destructive nature and capability of taking human beings from its very nature by means of flaunting

technological superiority is also notable as he had called for the decolonisation of the education system and the Indian minds. To take instincts from Gandhi and Tagore in highlighting indigenous knowledge systems and the development of scientific and technological self-reliance on humanitarian grounds is the need of the hour.

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Conflict of Interest

We the authors hereby declare that there is no competing or conflict of interest in the title and the findings of the research paper.

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