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Science and Colonialism in British India

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Abstract

Modern science developed by its application to the industry and commerce, and this happened together with the colonial pursuits. Science claimed to be "modern" and "universal," and to change the world and human knowledge for better, but its claim to "objectivity" and "neutrality" has been doubted in recent works. This essay examines the relationship between the scientific developments in the West and the colonial domination of the non-West, for which science was used as a justification. The British colonialism in India, along with the Indian response, especially Gandhi's, is the context of this essay.

Keywords: **Science, Colonialism, Modernity, Development, Gandhi**

I Introduction

This essay discusses the relationship between the growth of science in the West and the colonial expansion, by which the non-West was dominated, using science for justification. The development of science in the modern period, and its application for the industry and commerce, occurred simultaneously with colonialism. Science claimed itself to be "modern" and "universal" that was to change the world and human knowledge for better. But its claim to "objectivity" and "neutrality" has been questioned recently, exposing its mechanisms of hegemony and domination. It is correct that natural sciences may appear "insular" in a colony like anywhere else, but the same cannot be held for all types of sciences.

According to this view, the modern scientific knowledge perceived the traditional science and knowledge system as myth and hence "harmful," and so it marginalized the indigenous culture, science, and knowledge system etc. It gave a new idea of "progress" which was constitutively defined by western experiences. The problem grew further as it described itself as some sort of universal paradigm even though their accounts were mostly Eurocentric. It, thus, was a vision not insulated from the operation of power which resulted in imperialism and colonialism, but also a "discourse" which made the indigenous science and knowledge systems secondary. It can be said that military and economic superiority established the colonial power, but the discourse of cultural superiority, backed by scientific findings, seemed to consolidate, and expand the colonial domination.

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II Science and Colonialism

The modern science developed truly in the western culture as the Enlightenment had informed them the use of scientific rationality and methodology developed in the natural sciences for understanding society and creating social institutions for better. What made the modern western culture very distinctive was its scientific character and prestige it attached to the "scientific" (Bocock 1992, 256). This means that though the other world cultures developed empirical knowledge, it was not the same thing as theoretically organized science.

So, science was modernity's premium product which gave a worldview (so it claimed) uncontaminated by superficial belief systems (Alvares 1997, 294). It was supposed to flush out the many disabling superstitions from society which were made dominant by the church's authority for disseminating knowledge. But a closer look would expose the supposed "universal significance and value" of science, whose growth overlaps with the expansion of western capitalism. A scrutiny of these connections is therefore necessary.

The concept of "rationality," an Enlightenment notion itself, gave the understanding that a better society could be organized by using reason. Western Capitalism, for expansion, demanded new sources of raw materials and cheap labour and markets for its finished products and so the colonies were formed to serve this purpose. With colonialism came many cultural products of the West, which were justified by the use of science and technology, and the "superiority" of the West was reinforced by the image of traditional and primordial native societies (Kumar 2000, 24).[1]

Scientific knowledge provided the necessary basis for controlling nature and society both, which was used for colonization also. This was done by establishing the western culture/society as scientific, and hence superior to the non-western colonized societies like India, which needed to embrace the scientific knowledge system, and emancipate themselves form the oppressive traditional knowledge system. This was the way to go for overcoming the social malaise, after which a better future could be imagined.

This essay intends to demonstrate that science, modernization, and colonial domination paraded together (Kumar 2000, 26). This can be understood by examining the shape science took in the colony and how scientific discourse played out for achieving the colonizer's objectives. The scientific discourse claimed to discredit the indigenous scientific traditions and medical sciences. How was this discourse and the introduction of "new" science received in British India?

[1] This notion makes colonialism a discursive practice, not only a form of politico-economic-military control. In ancient India, direct observation of natural phenomenon and rational processing of empirical data were encouraged (Kumar 2000, 24).

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III The State and Scientific Education

The British recognized rather quickly how important science, technology and medicine was for building the empire (Kumar 2000, 28). So, the colonial state, even though it claimed to be in a disinterested project of civilizing mission, actually came with an ideological purpose, and a set of institutions and people to realize this. The colonial scientists and their works in geology, botany, and medicine, in fact, worked to consolidate the empire. By the mid nineteenth century, partly because of a rapid growth of science and technology in Europe, British India came to be seen by the colonial state as a good testing ground for the new applications of science and technology (Baber 1998, 185).[2] In India, the state sponsored scientific projects for research and development in a big way. Also, the state sponsored educational institutions provided the channels through which the western science and technology got diffused in Indian society.

Even though the indigenous education in India, prior to the British colonial rule, included instructions in science, the debate over which system of education should be adopted for India was mainly about the kind of science and technology to be eventually institutionalized in India (Baber 1998, 186-7). The debate concluded in the favour of introducing modern science in the field of education.

IV Reception and Response

The response of the emergent urban middle classes should be understood in the context of structural transformation in the Indians society, which included the establishment of colleges for teaching English language and literature. Impressed and stimulated by the scientific and industrial progress in the West, the Indian elite began to scrutinize indigenous religions and society in the light of scientific reason, and, as Gyan Prakash points out, science's authority as a "grammar" for transformation was highlighted (Prakash 1999, 60).

The Indian thinking at this point of time characteristically emphasized on "cultural synthesis." This was because colonialism caused collision between the cultural systems of the West and India, influencing the identities of both the colonizer and the colonized (Kumar 2000, 29). Due to this process, the colonized came to see itself in the image of the colonizer, accepting the superior value of scientific reason. For the educated Indians then, retrieving the "original" identity was necessary for reclaiming the sovereignty which was lost to the British. Recognizing the cultural synthesis meant that they were able to absorb the sense of loss, and it also provided them with the opportunity to overcome the designs of the colonial project

[2] There was no explicit science and technology "policy" in the earlier phase. This is because only with the evolution of the colonial state, the idea of "science for profit" could emerge (Kumar 2000, 28).

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(Kumar 2000, 31). They therefore made attempts to show that modern science was compatible with the indigenous cultural practices.

The two major religious streams, Hinduism and Islam, engaged with modern scientific knowledge from the vantage points of their own political and cultural contexts, not always in isolation from each other (Habib 2000, 64). However, these two responses were qualitatively different. Whereas within Hinduism, the western educated middle-class intelligentsia took the lead in advocating the critical assimilation of modern science, as well as making it a morally legitimate activity, within Indian Islam, most of the interlocuters were grounded in an orientalist intellectual context, where exposure to Western education and culture was minimal (Habib 2000, 225). Because of their economic position and status in the traditional society, acquired through western education, the middle-class intelligentsia acted as the "agents of modernity." They had a hegemonic control over the society, therefore, western science and education in English came to be regarded as the "main avenue for achieving that status" (Baber 1998, 225). Rammohun Roy could represent the educated Hindu middle class and could appeal to Lord Amherst against establishment of the proposed Sanskrit college, but nothing similar could occur within Muslim community, even as some sporadic attempts were made, now and then (Baber 1998, 225).

Sir Syed Ahmed made a sustained effort though and inaugurated a school of revivalism (or reconstructionism) which was "convinced that some adjustment was needed to equip Islam to face the challenges of the modern civilization," denying the authority of the orthodox Islam at the same time (Habib 2000, 67). Ahmed rejected what was obscure and mystical in Indo-Islamic traditions. He felt that Muslims were not thriving under colonial rule only because of lack of modern education. Therefore, it was the aim of enabling the Muslim community to participate more actively in the colonial society, just as Rammohun Roy had done so a few decades earlier, that motivated Sir Syed's modernist response to science, technology, and English education (Baber 1998, 226).

This suggests that in the changing structural conditions under the colonial rule, the elite sections of Indian society became active agents of transmission of this "new" scientific worldview. Therefore, it is not correct to say that modern science was necessarily imposed, it was rather expediently received at times.

V The Reconstruction of India: Gandhi's views

Within the nationalist movement, the debate on the regeneration of India centered on the scientific knowledge and its use. Madan Mohan Malviya, among others, stressed that India was deindustrialized, and advocated using science and technology (like Japan and Germany, as the British system was inadequate), but Gandhi wanted to rescue even the British from the hazards of modern science and technology (Kumar 2000, 35; Vishwanathan 2000, 82).

Gandhi ridiculed the most prized possessions of the West – modernization and industrialization. He replaced the words "science" and "technology" with "civilization" and "mechanization," for which he showed a very deep concern.

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Some of the central tendencies of modern civilization, like massive industrialization, and an undue importance given to science, which altered the concept of labour, made Gandhi into its one of the biggest critics. By civilization, Gandhi meant "that mode of conduct which points out to man the path of duty" (Gandhi 1997, 67). The mode of conduct represented by western civilization, is connected with the enlightenment and the industrial revolution, and it brought into existence a new away of living. It was characterized by a changed view of human nature and of the man's relation with the environment. The environment was viewed in isolation from the rest of society, which required to be mastered for serving the need of human beings, and human development broadly meant economic growth only.

Growing aspirations of profit led to the colonization of certain parts of the world which were also to serve as markets for the finished products. Technology and machinery for Gandhi, represented therefore the greatest sin since it had dehumanized the "Western Civilization" to much extent, and hence it could not be a solution to India's problems. He was not averse to technology, but his main concern was not to use machinery for producing things which we could produce without its aid, because machinery makes us its slaves and is of least help when we want to be independent and self-supporting. Therefore, he rejected the Western view of science, which saw nature as something autonomous from society, that which can be acted upon to transform the society.

Gandhi, however, is not one-sided in his critique of the modern civilization and its undue emphasis on technology and the use of machinery. For him, technology can make "a positive contribution" if it is informed by "a moral vision of the human good" (Parel 1997, lvii). He pointed out the harmful potential of modern technology only, and argued in favour of a technology which would be appropriate for India in terms of meeting its needs. The real development of India would mean reconstructing a non-violent social order – which, he says, depended on an appropriate system of education and an appropriate technology.

The modern technology was definitely not conducive for this. This explains why the modern technology needed to be discarded. But how can it be possible? For this, Gandhi exhorts us to develop a critical attitude towards it as he feels that the "fascination of Indians for modern civilization" comes from "the uncritical attitude" they have "towards the existing educational system" and the "machinery" (Parel 1997, lvi).

In fact, Gandhi goes beyond the critique of modern technology by the positivist philosophy of science, which has influenced modern science and technology in a big way. As Parel remark:

> He wanted a technology for India that would improve the material welfare of all not just that of rich and the highly educated, and improve it without undermining the process of self-rule. His debate is not on whether India needs

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technology, his debate is on the kind technology that India needs (Parel 1997, lvii).[3]

Gandhi here stresses on the fact that India must not make the modern materialism her goal, as in doing so we will not achieve the real progress. He refers to the ancient ideal of limiting the activities for wealth generation and argues that being too much ambitious materially is like falling from this ideal. His argument is based on "the need of the hand-spinning and hand-weaving industries," the "little mills" that provide the peasants with "some supplementary industry" ("Gandhi on Machinery, 1919-47," in Parel 1997, 164-5).[4] The spinning-wheel remained for him a symbol of many things of spiritual dynamism, of the importance of manual labour, of solidarity between the rich and the poor, which he greatly emphasized upon. It also was used by Gandhi to show the protest against the tyranny of modern technology and scientific inventions and the economic exploitation of the poor by the rich. One great significance was that by adopting the spinning-wheel, he not only tried to solve the problem of unemployment but also declare that it will not lead to exploitation of a nation by the other, by colonizing it ("Gandhi on Machinery, 1919-47," in Parel 1997, 167).[5]

VI Responses to Gandhi

Though Gandhi received support from scientists such as P. C. Roy (he even pleaded for the charkha), he was criticized by M. Visvesvaraya, an engineer, and M. N. Saha, an astrophysicist (Kumar 2000, 34-35).[6] They both argued for planning and industrialization, and the debate on economic development concluded with the endorsement of democratic socialism, with mixed economy. The discourse on "development" was controlled by a group of experts but justified in the name of the people. Nehru's proposal for a socialistic, planned development emerged as the most viable option, integrating state-controlled planning with democratic values. But he fell in a trap, attempting to combine Gandhi and Visvesvaraya.

In the end, we can say that colonialism was not monolithic, and the state-science relationship was also problematic. Even as state sponsored initiatives were taken to promote scientific knowledge, "the state was not put to the use of science," Nandy says, rather science got used by the state (cf Kumar 2000, 38). The emphasis on "development" by planning shows

[3] Gandhi shows that technology and economic development are related. If India embraces modern technology, it perishes, as historically it has tended to be beneficial only for the skilled and the powerful. He also rejects the positivist dictum of "universalism" of modern science as he points out that "the whole of India is not touched" (Gandhi 1997, 72). And, hence, he argues, since Indian Civilization can absorb the shock, it can regenerate itself.

[4] It is clear here that for Gandhi the supreme consideration is the man. Since, the modern technology stressed on labour saving machinery, he opposed it as it would have rendered many thousands without work.

[5] He, therefore, tries to attack the colonizing and imperial practices by attacking the machines. This is because he sees modern machines as making the humans its slaves. According to him, it created a mad rush for material advancements which ultimately resulted in colonialism.

[6] In response to Gandhi's *Industrialise and Perish*, Visvesvaraya even wrote *Industrialise or Perish* (Visvanathan 2000).

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that India didn't see science as a culture to be celebrated, but it was only a formula to be prescribed or a drug to be followed. Independent India saw science only in instrumentalist terms, like a magic wand to create prosperity. It made the project of development a "discourse," prescribing uniform solutions for the economic problems of India. It ignored the "local histories", and "local knowledge" which could have provided the alternative visions of development using indigenous experiences.

The increasing emphasis within social sciences on re-claiming these local histories have changed the situation a bit. Now people's groups in villages have begun insisting that they be allowed to live their way of life, in congruence with the environment, which shows their rejection of the modernist ideas of development. The disenchantment with the modernist development may be seen as repudiating the claims of modern science as well, for its bias towards the environment (Alvares 1997, 310).

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