

## **Establishing Colonial Hegemony through Science: A Study of British India and Robinson's *Mars Trilogy***

**ADITYA RAJ<sup>1</sup> AND STUTI PRASAD<sup>2</sup>**

<sup>1</sup>Research Scholar, Patna University, Patna, 800005

E mail: aadiyamittal@gmail.com

<sup>2</sup>Associate Professor, Patna University, Patna, 800005

Email: stuti.pwc@gmail.com

### **ABSTRACT**

Science and technology have always been used as powerful tools, and technologically advanced countries like the USA are consequently more powerful. In the modern context, power can be seen in the hands of transnationals or multinationals that control society through science. Looking at the historical use of science as power the example of the British is prominent as they used science and technology as effective instruments to establish and consolidate their control over India. For this purpose, they established scientific universities in India, constructed Railways in 1837 for easy and fast transportation of resources and introduced postal and telegraphic services.

It is interesting that this strategy of using science and technology is found across the globe in the hands of those who want to establish their hegemony. The science fiction *Mars Trilogy*, which is very futuristic and imaginative, uses this motif. In the novel the transnationals, using science and technology, start shifting the inhabitants of Earth to Mars for the extraction of its resources and to establish hegemony over the new colony. *Mars Trilogy* is an excellent depiction of how colonial powers use science, and it contains an implicit warning for the future.

**Keywords:** terraforming, science fiction, colonisation, transnationals, hegemony, British colony.

### **Introduction**

After the decline of the Mughal Empire in India, the European powers started looking at India with utmost interest and initiated the process of establishing their rule over the Indian territory.

However, it was the British who succeeded in this endeavour and not the other European powers. Rajiv Ahir in his book *A Brief History of Modern India* writes that due to naval superiority, military skills, the introduction of a technological revolution in India, financial stability, stable government, etc. the English succeeded in overthrowing other European powers like the Portuguese, the Dutch, the French, the Danes and established their new colonial setup in India.

To rule over India after the Mughals was a question that was a challenge before the European powers; however, the British, with their strategy, technological advancement and use of science, overcame other European powers in this matter. Nevertheless, it was not easy to overthrow the other European armies, but with technological development applied across different sectors, the latest technology and a strengthened military the British encountered the other European forces in India with success.

Francisco De Almeida, who was appointed as the governor of India in 1505, elaborated on what was required to rule over India and said “*if you are powerful at sea, you will hold India as yours and if you lack this power, you can’t even build a fortress on the shore*” (Ahir, 2016, p. 22.). This glimpse of power described by Almeida is enough to understand the applied strategy of the British on Indian lands. After the battle of Plassey (1757) the British started to gain control over the Indian territories either through the mode of war or through diplomacy. They started their expansion through administrative policies like “Ring Fence”, “Subsidiary Alliance” and “Doctrine of Lapse” (Ahir, 2016, p. 120-125).

The British policy after the revolt of 1857 changed for greater concern towards making a modern India. The transfer of power from the East India Company to the government of Britain introduced a new level of changes in the Indian cultural and educational policies. Through the mode of trade, they deployed

---

This paper was first presented in the International conference on the “Role of Indian Science in Freedom Movement (RISFreM 2022)”, organised by JNU in collaboration with VijnanaBharati, CSIR-NIScPR, and VigyanPrasar on 28 February 2022 and 1 March 2022.

and the policy of divide and rule they adopted, the British succeeded in establishing their hegemony over the Indians. British India during the 19<sup>th</sup> century was also progressing slowly towards adopting the required means for the study of science and technology, but this imparting of technical education to the Indians was basically the plan of the British to impose colonial authority over the Indian people through the use of science. The British in India came with the mission of trade through their East India Company with the motive to exploit the abundant raw resources, cheap labour of the land and to extract the plentiful spices required for the European markets; they even enforced the farming of Indigo which was sold at higher prices at the international market (Chandra, 2001).

Science and technology have always been the topic of esteemed discussions. We can see the use of science in different fields including war, in building a progressive society, in the domains of education, health care, and the military; but among them, the most important is the use of science in strengthening the military power of the nation. This paper aims to present a comparative or rather parallel study of the historical events in the context of the use of science and technology by the British in India and the imaginative futuristic events described in the science fiction *Mars Trilogy* by Kim Stanley Robinson.

*Mars Trilogy* by Kim Stanley Robinson is an award-winning science fiction trilogy which consists of three volumes — *Red Mars*, *Green Mars* and *Blue Mars*. The three volumes are very interesting and very detailed in explaining the plan of spreading human colonies on Mars through the process of terraforming. Though modern science and technology are capable of achieving giant feats either in the field of medical science or engineering, the process of terraforming adopted to colonise Mars and the use of scientists as material for experiment to fulfil the needs of the transnationals is very similar to the intentions of the British colonisers in India.

The British gained access to power through their application of science and technology on the geographical land of India, with the purpose of exploiting the ample resources of this land. Transnationals in *Mars Trilogy* too adopted the British policy of gaining power through their advanced knowledge of science and

technology or “*computerisation*” (Lyotard, 1979, p. 31-91) and establishing their domination over society. However, unlike the British, they aimed to colonise not just a nation but the entire universe.

In Gramsci’s use of the term hegemony, there is a deviation from the classical Marxist ideological view of term; in fact, Gramsci stated that hegemony provides negotiations and exchange and conflict between classes, thus moulding Marxist categories to fit modern post-industrial society where diverse ideas play a leading role (Abrams & Harpham, 2020, p. 208). This concept of negotiations and exchange can be well understood in the modern context where we exchange goods with money. The transnational hegemony, too, is inclined towards this mode of exchange of technological equipment wherein they target economic benefits, the progress of the society, development in science and technology as well as creating a colonial world and not a nation within the democratic sphere.

The definition of colonisers according to Merriam Webster’s dictionary is ‘a nation or state that takes control of a people or area as an extension of state power’, which means that the colonisers are those who forcefully take control over the other nation, for instance, in history the British colonised India. In the same vein, in the science fiction *Mars Trilogy*, the multinationals take control over the entire world through the use of science, thus imposing their hegemony to gain control over the society so that they could build their colony. *Mars Trilogy* explores the imaginative surface with the notion of underpinning future colonies and the colonisers.

Throughout the three volumes of the novel, we see a revolution raised by the group of scientists to free Mars from the forced hegemony of the transnationals like the Indian scientists and the intellectuals who after acquiring the knowledge provided by the western science, philosophy, literature, etc., fought for their rights and the freedom of their nation, the scientists in *Mars Trilogy* too fought for their independence from very rigid conditions on Mars where they are time and again exposed to traumatic radiations.

In this sense, we can conclude that despite the scientists wanting to terraform the planet, their work on terraforming could

not be independent of the transnationals. It is very clear that advancement in technology is the process that has been adopted by humans for ages. Today, we call the USA, UK, Japan, Russia, etc. the developed countries because they are technologically ahead and advanced.

It is important to note that our great scientists have discovered many technologies to ease the process of human efforts which can save time and allow humans to perform efficiently. However, the sudden commercialisation of scientific instruments has created another kind of revolution in the field of science and technology.

### **Objective**

To present a comparative study of the use of science in Indian history by the British and the role of technology in Robinson's *Mars Trilogy*.

### **Relevance**

The paper highlights certain aspects of human behaviour and shows that what has happened in the past related to hegemony and control will keep on repeating itself whether it is related to general society or scientific and technological development.

### **Methodology**

Qualitative methods are used which include narrative research and study of texts and documents.

### **British India and the use of technology**

When we look at British India, we often become acutely aware of the backwardness of the Indians compared to the European advancement in the field of science and technology. Nineteenth-century England was progressively moving ahead on the trajectory of the industrial revolution; enormous industries were set up, partaking in the process of making a techno-centric society that would, in future, help them to establish their domination over the world. With outdated technology, the colonisers could not have gained control over either the raw materials or the human resources of the colonised.

Advanced technology provided powerful tools in their hands. In fact, to some extent, it becomes the fate of the colonised countries that it is the process of colonisation through which they are introduced to the technology that would prove helpful to them post-colonisation. Access to the latest technologies as used by the colonisers was always appreciated and demanded even during the colonial times. In India for instance, John Hargreaves's spinning jenny (made in 1764) was very soon adopted by the weavers who further asked him to make more such machines so that they could benefit from the overseas market. It was the same weavers who at first fought against the advent of these machines fearing that it might throw them out of the domestic market, but when they realised the efficiency of these machines and understood the international market policy for profit-making, they soon started exporting the same products that they earlier used for domestic markets (Ahir, 2016). From this point of view, it may appear that by providing the weavers with the machines British actually gained their favour, thus, moving an inch closer to their target of colonising India.

With the advent of steam engines by James Watt in 1769, the course of Railways started to spread across the globe and the very first steam locomotive engine in Britain was used in 1812 for carrying coal. The function of the engine and the efficiency of science used in its work process or function can be understood with these lines — "*The locomotive's cylinders drove the pinions through right-angled cranks so that the engine would start wherever it came to rest*"([www.nationalarchives.gov.uk/railways/](http://www.nationalarchives.gov.uk/railways/)).

The British launched railways in India in the year 1837. For the British, the railway was a means of transporting their goods and raw materials to the port as well as providing transportation facilities to the traders and the colonial passengers. The coming of railways in India has been beneficial for us and nowadays we have incorporated the latest technologies in the Indian railways. However, it is important that we also focus on the efforts of the workers cum engineers who helped to construct these railway lines across India during the colonial period. Though railways eased the transportation process, for the colonised Indians it was also used as means of spreading their ideas among other people

across India to ignite the fire of revolution and freedom within many of them apart from the transportation process.

However, the Indians were basically assigned the role of providing cheap labour to the colonial science machinery. The efforts of the Indian workers constructing railway lines across the country were not given much importance by the British, neither did they give any special privilege to these workers, thus, taking advantage of the cheap Indian labour. In order to maintain their superiority and continue to be the ruler, they needed to introduce advanced science and technology in India and the coming of railways was the starting point in their endeavour of strengthening their grip to colonise India.

### **British India and the scientific institutions**

Because India was a large colonised country, therefore, the British thought to train Indians in all areas including science and technology. For this purpose, they started setting up universities in nineteenth-century India and the first university was a theological university founded at Serampore near Calcutta in 1818 by a group called “The Danes”. This was followed by the setting up of five more universities between 1850 and 1900 at Calcutta, Bombay, Madras, Allahabad and erstwhile-undivided Punjab. The first two medical colleges in India were set up at Madras and Calcutta in 1835 and the first scientific research organisation was established by an Indian, Mahendra Lal Sircar, which was the Indian Association for the Cultivation of Science (IACS) at Calcutta in 1876.

At the end of the nineteenth century, India had a total of six science-related societies (including the Asiatic Society of Bombay, set up in 1804) out of which two were professional societies: the Agricultural and Horticultural Society of India (1820, Calcutta), and the Bombay Natural History Society (1883) (Nptel, lecture 25.). Moreover, the Charter Act of 1813 incorporated these necessities to educate and promote the knowledge of modern sciences among Indians. The British used “downward filtration theory” as stated in 1835 in Lord Macaulay’s ‘Minutes’ emphasising on introducing English as a language in the Indian education system. The British sought to train Indians in English so that they could be used as interpreters between the

government and the users of the vernacular so that the knowledge of western sciences and literature could reach the masses.

The British agenda of imposing the English language on the Indians for teaching western science was again related to the issue of profit for the British in two aspects. The first one was to establish colonial control so that the Indians could be used as interpreters between the government and the general public as stated above. The second one was to show the Indians that without the support and help of their masters they would not be able to gain access to the western sciences and the development made by the Europeans. This motive acted as the blueprint for the mental colonisation of Indians who now instituted the idea that they were inferior to the British.

With the establishment of these universities in India the British aimed at imparting education to the Indians with the implicit intention of mapping the geographical land, the climate of the country, etc which would further strengthen their colonial authority. It is very interesting to see the different meanings of science for the Indian scientist as RK Kochhar has stated in his paper '*Science as tool in British India*' where in different meaning of science is based on the social and cultural background of the Indian scientists, for instance, for CV Raman, born in a caste conscious society science was a means of establishing a 'gurukul' on his terms. For Homi Jahangir Bhabha (1909-66), an aristocrat by upbringing, science meant building national institutions under the auspices of independent India's government, etc. (Kochhar, 1991, 1933.)

### **British India and Robison's *Mars Trilogy*: A parallel study**

Terraforming is the process of converting an inhospitable planet into a hospitable one. *Mars Trilogy* depicts not only the scientific aspects but also the economic and political aspects of the transnationals who are actually controlling the world through science. The scientists and experts in the novel *Mars Trilogy* were trained by these transnationals in a very similar manner in which the British trained Indians for their own capital benefit. The transnationals trained the group of scientists for the first-ever human Mars Mission with a vision of terraforming the red planet so that a human colony could be spread across the universe.



The transnational's vision to colonise Mars was mainly due to two main reasons: The first one was to extract raw metals, nitrogen, and other mineral resources which had been stocked out on Earth due to overpopulation, and to maintain their power and prevent revolution they needed these materials. Secondly, because Mars has always been the attraction point for the people on Earth, transnationals moved a step ahead and envisioned ruling and expanding their power not only to states or nations but also to another planet, to the universe. In this sense, these transnationals are like the colonisers who colonised other countries for extracting raw materials and exploiting cheap labour. The British colonised India with the same motive of extracting resources and utilising cheap labour.

Though we are living in a democratic society, in reality, the multinationals control the society and this is what Lyotard pinpointed back in 1979 by raising suspicious fingers on IBM and the future storage of knowledge by these computer-owned giants. Thus, establishing a new hidden colonial rule over the world. The group of scientists that the transnationals trained in *Mars Trilogy* were sent on a mission which was too dangerous, thus turning scientists into human material for experiments. Moreover, when these groups of scientists landed on the surface of Mars and started conducting their research on the project of terraforming, they soon realised that the transnationals have sent them not only to extract the resources but also to create a mirror image of the Earth. These scientists had received special training in Antarctica on Earth where the transnationals had strictly monitored their actions so that under no circumstances would they dare to revolt against them.

The revolution of 2061 on Mars as given in the first book of the trilogy titled *Red Mars* is very similar to the revolt of 1857 in India against the British which failed miserably and made the colonisers more conscious of their power. The futuristic revolution of 2061 in the *Mars Trilogy* is very imaginative but also repetitive in nature, — whatever has happened in the past will occur in the future again. This is because human nature will remain the same throughout either on Earth or Mars. This unchanging human nature can be found in the *Mars Trilogy* where the transnationals intend to colonise one more planet and exhaust

its natural resources. Indeed, the colonisers benefit greatly in economic terms when they colonise any country, while the people of the colonised countries are not only deprived of basic human rights but the climate and nature get greatly affected. The scientists in *Mars Trilogy* did not expect to be treated the way they were treated out there on Mars. They run away from the multinationals to save their lives and also learnt to live in very severe conditions. This instance from the novel is very similar to the murder of Indians by the British in the Jallianwala Bagh massacre. Because the scientist revolted against the transnationals, they were tortured and killed by the police force or the secret spy sent by UNOMA (United Nations Office for Martian Affairs).

The scientists and their expertise as mentioned in Table 2 given below show that their expertise is of no use without the material support from the transnationals. In the same way, Indian scientists too were not given high positions by the British, thus, hindering Indian scientists and also the idea of “democratisation of science” from the beginning. In the very same sense, Kim Stanley Robinson’s *Mars Trilogy* reflects the condition of the colonised especially the indigenous groups of scientists who were colonised by the transnationals during the Mars Mission. Let us look at the expertise of the Indian and Robinson’s scientists in the following table.

<b>S. No.</b>	<b>Scientist Name</b>	<b>Inventions/Expertise</b>
1.	Satyendra Nath Bose	Collaborating with Albert Einstein in developing the foundation for Bose-Einstein statistics and the theory of the Bose-Einstein condensate.
2.	Homi J. Bhabha	Founder of Bhabha Atomic Research Centre (BARC) and the head of India’s nuclear programme.
3.	Ramanujan	Findings on Infinite series for pi, analysis, number theory, and continued fractions.
4.	CV Raman	Discovered the Raman Effect in Physics.
5.	Jagadish Chandra Bose	Invented the Crescograph to measure growth in plants.

<b>Table 2 — Robinson's Scientists from the <i>Mars Trilogy</i> and their field expertise</b>		
<i>S. No.</i>	<i>Scientist Name</i>	<i>Inventions/ Expertise</i>
1.	Hiroko Ai	Aerophany
2.	Arkady	Engineer
3.	Sax Russell	Terraforming
4.	Phyllis	Space Elevator project
5.	Nadia	Construction Engineer

Through Table 1 and Table 2 a very distinct comparison can be deduced which is as follows:

1. Indian scientists during the colonial rule fought with the British for not only their freedom but also demanded to impart to Indians the knowledge of western science and for not imposing restrictions on their experiments; they later became field experts. One is obliged to a few British intellectuals who rendered the teaching of science to the Indians so that the true nature of education did not get hindered.
2. Robinson's scientists were already the field experts and were conducting their experiments on earth with a vision of a trip to Mars. Robinson's scientists were colonised at a later stage.

Through the above two points of comparison, we can conclude that Indian scientists of the nineteenth century and early twentieth century became scientists in a colonised society but Robinson's scientists got education in a free democratic country and still became part of colonisation by the transnationals. Now, this is where we need to shift our focus and understand that despite education in democratic nations their education was subjugated to colonisation and they were helpless maybe because they never expected the repetition of history that too at an age which was scientifically advanced and ahead. Both the groups of scientists revolted because they had a clear and fair vision and wanted to use science for the welfare of society. It is very interesting to see how these colonisers (both British and transnationals) utilized the science and expertise of their scientists to gain colonial hegemony.

Excessive suppression always leads to revolt as we can trace from historical events. All of this can be seen in the context of British India and the imaginative representation by Robinson in the *Mars Trilogy*. Once colonised, the people who are deprived of basic rights will always generate the idea of revolution, they will always think to free their culture, religion and fight for individual freedom.

The expertise of both groups of scientists could have provided a very new dimension to the world only if they were allowed to act more freely. There is no doubt about the dismal condition of the Indian scientists whom the British considered inferior to the European scientists; for instance, Satyendra Nath Bose, who worked with one of the greatest scientists of the world Elbert Einstein, exemplifies the talent and potential of an Indian scientist. Removing the barrier between the Indian scientists and Robinson's scientists and evaluating them on the grounds of their talent, potential, and vision as well as their circumstances of being colonised, we learn that these scientists have been of great use to the colonisers both in terms of their progress and the economy. Therefore, the initial phase of hegemony starts with education that these colonizers impose, in the case of transnationals this hegemony is inbuilt unconsciously where one believes that they are part of a free nation and that education is their right.

The hegemony of the current technological companies is silently summoning society to be a part of the colonisation process presented in a new form. In *Mars Trilogy* we learn about the situations that force the scientists to flee away from the earth and agree to settle on another planet where society will be ruled by scientists and other intellectuals. However, the feeling of homelessness within one's own home is the biggest problem that the people of the colonised country feel; for every basic thing they have to depend upon their colonial rulers. In British India the Indian scientists were forced to conduct their research in England because advanced laboratories were unavailable then in India; in the same manner, the scientists left to die on Mars wanted equipment to support their life on the land which was full of harmful radiations. In other words, the scientists in *Mars Trilogy* were like the Indian scientist dependent upon the transnationals to provide life-supporting materials from Earth.

The vision of the Indian scientists and the scientists in the *Mars Trilogy* is similar because they want “democratisation of science”, they want to build an egalitarian society as Arkady from the volume *Red Mars* wanted to build and the establishment of society by these scientists has several key points that deliver the message that the world will run more efficiently in the hands of the educated who are free from the desire of self-centred commercial profits. *Green Mars*, the second volume in the *Mars Trilogy* enumerates the points made in the general meeting of the colonised people on Mars for constructing a society which will not be like that of the transnationals as seen on Earth. The following points given by the scientists are worth mentioning (*Green Mars*, 444-445)

1. Rather than considering Mars as a nation, Mars is to be considered as a world composed of different cultures and religions along with freedom of religious and cultural practices.
2. Each individual will be provided with inalienable rights, health care, education and equality.
3. The air, water and land will be the sole responsibility of the people living therein. These will not be owned by a single organisation.
4. Making an economy that balances self-interests with the interests of society at large, which means the labour of individuals and its fruit remains with them and cannot be taken away by another individual or group.
5. Making the economy sustainable for the entire biosphere.

The first point that states Mars as a world rather than a nation is the best vision by the group of colonised scientists for building a society free from the rules of the transnationals; in fact, this idea of uniting different parts of the land into a single unit is the best idea of eradicating the hegemony of the transnationals. The idea of giving respect to different cultures and religious groups is quite democratic. The second point that focuses on the necessity of education and proper health care for all is what was restricted during the colonial period. In British India, the benefits of the health or education systems were restricted to the British and the Indians found it difficult to acquire higher education and

improved medical facilities. The fifth point which believes in a sustainable economy for the entire biosphere is the only hope of eradicating the capitalist society and bringing economic equality.

### **Conclusion**

British India may have many drawbacks and represents one of the cruellest moments of Indian history, but that period has also given many insights to the researchers and scientists on how science could be used in a more democratised way. This paper aimed at conducting a parallel study of history and the future through the study of British India and *Mars Trilogy*, a science fiction by Kim Stanley Robinson. This paper presents the view that in future, establishing colonies rests in the hands of the multinationals who may start controlling the society slowly and insidiously. History is very repetitive. The British gained control over India and expanded their supremacy through the use of science.

This parallel study helps us to establish a strong similarity between colonial India and the futuristic, very imaginative envisioning in the science fiction *Mars Trilogy*. This study confirms that human psychology and politics remain the same across varied geographical locations and time zones. Though we believe that we are living in a democratic society and the colonisers are long gone in history, the multinationals or transnationals are the modern colonisers who secretly, with the help of science, may start the process of establishing their hegemony over the society. Science fiction like *Mars Trilogy* throws light upon such sinister designs of the transnationals and reveals how an illusion is created by them of public welfare they do through the use of science, while commercialisation of the resources achieved, money making and gaining political supremacy not only on Earth but expanding it to the universe may be their real motive behind using science and technology. Since science has always been used as a tool by the colonisers and since they have used it in the past, there are strong chances that they will again use it in a more advanced form in the future to establish their hegemony. Robinson's *Mars Trilogy* has shown the way and constitutes a warning for us.

## References

- 1 20 Indian Scientists Who Changed the World. (2021). Retrieved from <https://leverageedu.com/blog/indian-scientists/>.
- 2 Abrams, M.H., & Harpham, G.G. (2020). *A Glossary of Literary Terms*. Cengage Learning, New Delhi.
- 3 Ahir, R. (2016). *A Brief History of Modern India*. Spectrum Books, New Delhi.
- 4 All Change! On British Railways. (n.d.). Retrieved from <https://www.nationalarchives.gov.uk/railways/>.
- 5 Chandra, B. (2001). *History of Modern India*. NCERT, New Delhi.
- 6 Kochhar, R.K. (1991). Science as a tool in British India. *Economic and Political Weekly*, 26(33), 1927-1933.
- 7 Lyotard, Jean-Francois (1984). *Postmodern Condition: A Report on Knowledge*. Manchester University Press, UK, Translated by Geoff Bennington and Brian Massumi, pp. 31-91.
- 8 Robinson, K.S. (1992). *Red Mars*. Random House, New York.
- 9 Robinson, K.S. (1993). *Green Mars*. Random House, New York.
- 10 Robinson, K.S. (1996). *Blue Mars*. Random House, New York.
- 11 Science in Colonial and Modern India. (n.d.). Retrieved from <https://egyankosh.ac.in/bitstream/123456789/12201/1/Unit-7.pdf>.
- 12 Science in Colonial and Post-colonial India. (n.d.). Retrieved from <https://nptel.ac.in/content/storage2/courses/109103024/pdf/module5/SM%20Lec%2025.pdf>.