This exploration unravels the underlying cultural and philosophical underpinnings of the enterprise of science especially in the context of colonialism and as it emerges through the writings of Amitav Ghosh. One rationale of doing this is to unveil the ‘shadow lines’ demarcating science as a privileged activity, immune from the social impulses of the times. Science, which is assumed to be divorced from socio-cultural elements and thus fashioning itself in a vacuum of sorts (in such transcendence is also said to be located its chief strength), is seen in this study as being fashioned by the philosophical underpinnings of the age. But, more fundamentally, the present attempt to focus on science is to underscore the intimate relation it has had with colonialism. Both as a ‘tool of empire’ in its instrumentalist use of science and technology to help the advances of imperialist powers and also, equally powerfully, as a discourse of power- emphasising its importance in putting the imperialist powers in a far more powerful position vis-à-vis the parts of world they were out to subordinate. So machines not only became the ‘measure of man’ but also the very rationale for the Empire in the first place. Empire was predicated on science as a touchstone and it becomes meaningful to understand the dynamics of science both as a discipline and practice in these times.

Amitav Ghosh has been sterling in his numerous attempts to capture this complex exchange during the colonial encounter through his numerous works. His stance lends itself to this kind of a reading more so because of his affinity with the ‘spaces within the categories’ rather than categories themselves. Apart from analysing the dynamics of the introduction of western science in India, this study revisits the epochs of Romanticism and Victorian times, as two distinct ‘cultures of knowledge’ in the metropolis that charted the progress of science in these contentious times.

The present study situates science in the aforementioned ‘culture of knowledge’ as a context that has powerful bearing on the practice of science as a discipline. Since
this study takes the context of colonialism as the backdrop to the spread of western science to India, the dialectics of this exchange are attempted to be understood. To underscore the complex nature of this exchange, Arnold observes that ‘...far from being monolithic, (science) manifests itself across time and cultures in myriad forms, reflecting as much as informing a given society’s cultural, economic and political modalities.’ (Arnold 1).

A reassessment of western response to science is undertaken from the Romantic times onwards because Romanticism itself was a reaction against Industrial Revolution and espoused a nature-centric approach to science. The philosophical spirit underlying Romanticism, together with the academic and cultural exchange, is seen as constituting a definitive ‘culture of knowledge’ and driving the direction of science as a discipline as well as influencing its core ethos. This was followed by an aggressive phase of colonial expansion in the Victorian times which ensured the enshrining of the mainstream Newtonian science as the ideal that spurred progress. The study examines in detail, the Victorian times as a volatile epoch of change and progress. Whereas, the Darwinian theory did shake the firm moorings of religion for the ordinary Englishmen, the ascending tempo of colonialism enshrined the new religion of progress. Through an engagement with the underlying philosophical ethos of these times, a case has been built about its influence on the growth of science as a discipline.

The study then takes a closer look at the encounter of Indian experience with western science as it came in varied avatars of technology, theory and discipline with the march of Imperialism. A mention of Amitav Ghosh’s engagement with this aspect of colonialism ought to be made here. His nuanced portrayal of the contact between Western science and India of the nineteenth century spans his oeuvre. Also since he is an author whose writing develops from an intensive research of the time and materials he portrays, he desists from painting with a broad brush. The nuances that are seen in his writing with regard to portrayal of science range from the depiction of characters like Balaram, in whose adulation of phrenology is captured the imitative aspect of growth of western science in India in his debut novel The Circle of Reason (1986), to his portrayal of the many ‘Science Societies’ that mushroomed in premier colleges of Pre-Independence Calcutta- much like the growth of such institutions in Britain.
during the nineteenth century. His delineation of characters like the Lamberts, in whose approach to science there is a marked influence of Romanticism to the sinister portrayal of the technology of the opium *carccana* (factory) as a resultant of the odious Utilitarian impulse of the Victorian times. The list is not exhaustive but illustrative and an engagement with these varied facets of science became the very impulse for an initiative like the present one.

To go into greater details of the exploration into Romantic times - this study has aimed at establishing the proliferation of science in the larger ‘culture of knowledge’ spawned by the Romantic revolt of the late eighteenth and early nineteenth century. It looks at how Romanticism attempted to situate itself as a counterpoint to the mechanistic science of the day and how eventually it was consumed by the sentiment of utilitarianism ascending with the unprecedented economic progress being made with the spread of the colonial Empire of England. It was deemed appropriate to analyse the Romantic Age for an enterprise like this because the romantic spirit essentially got galvanised as a result of the large scale social and ecological cost of the Industrial Revolution. More fundamentally, it was a movement of dissent against the ascending mechanical science, which provided the earliest impetus to the Industrial Revolution. This study has attempted to establish the rather widespread reach of Romanticism and by overstepping the confines of poetry and politics, it is seen as a strong undercurrent that was endeavouring to reshape the dynamics of contemporary science too. The rigid disciplining of knowledge was a later development and this period is also fascinating for its lively and inspirational exchange between poetry and science. As an aside, this fluidity between disciplines can be taken as a model for our refashioning of education to make it more holistic in the contemporary times.

The Romantic spirit in its heyday influenced the practice of science just as we are all too familiar with its influence on literature The veneration of nature was harking back to ‘simpler times’ that were pre-industrial and an attempt to connect to a higher power than focussing on material production alone. Romanticism heralded a markedly new sensitivity towards nature which viewed it as a fountainhead of energy that travelled through men, flora and fauna alike. Nature represented a superior intelligence that loomed in the backdrop like the towering dark mountain in Wordsworth’s *The Stolen Boat*. It was assumed to have the power to enter man’s
recesses like a spirit. The science current at this time was observational in nature and there was an attempt being made to catalogue the diverse life forms according to Linnaean taxonomy. This study predominantly looks at Botany in this regard because of Ghosh’s portrayal of the vicissitudes it underwent at this time. The diversity and variety inherent in the plant life in nature were sought to be captured through Botany. Whether one did through poetry or science did no matter much— the spirit that pervaded these investigations were almost identical in its veneration of Nature and divine design and it was not unusual to find Botanists who were poets and vice versa. Romanticism offered an alternative to the mechanistic, commercial ethos that was beginning to permeate the society.

The centrality accorded to Nature as a force and entity springs out of veneration towards life, perhaps the most vital characteristic of Romanticism. There is an exchange between the organic and inorganic realms that is sought to be unravelled through science. Science is an extension of this piety through which nature is to be better understood. The dialectics of exchange between man as an element of nature as opposed to the modern conception of man as being in opposition to nature is the bedrock of this understanding of science. The enterprise of science to the romantics was to teach man to better understand the bounty and beauteousness of nature. The venture to identify new species of flora and fauna which hit a high point at this time too added to the vitality of nature. Romanticism was opposed to the exploitative practices that were stemming out of the application of principles of the ascending Newtonian science which led to the Industrial revolution and its subsequent desire to multiply markets due to overproduction— a singularly important impulse for the enterprise of Colonialism.

Amitav Ghosh, as pointed out in the beginning, has tried to capture the spirit of Romanticism in the character of the scientist Pierre Lambert and his daughter Paulette and pointed at the diversity of beliefs governing science in this period. This exploration about romantic science arrives at the fascinating insight that the metropolis was a site where the wider culture of knowledge and philosophy was impacting the growing enterprise of science in very interesting ways. The Romantics were apprehensive about the imbalance between nature and man that was being accelerated by the new definition of progress, and in this way, they can be
acknowledged as the first ecologists. This sentiment was in sharp contrast to the Victorian quest for exploiting nature both at home as well as in the newly acquired colonies in the name of progress.

It is precisely this ‘Romantic’ sympathy to the environment in general and to the plants in particular that Ghosh shows through the portrayal of the father-daughter duo, the Lamberts in their approach to Botany as a science. Their attitude to plants in the Calcutta Botanical Gardens is one of veneration and wonder and Pierre Lambert’s attempts to catalogue them using the Sanskrit appellations points at the Romantic attempt to place science within a specific cultural context for it to retain its essence.

The discussion in the study then moves to the Victorian times with the Utilitarian greed as its ethos and its impact on the practice and institutionalisation of science in Britain as well as in India. This is the era of progress and by extension, progress understood in sheer economic terms. The optimism about science and the ensuing progress is the dominant spirit of this age. Deepak Kumar points at the stance of this brand of science: ‘…wherein the result-oriented research in applied science heavily supersedes the curiosity-oriented research in pure science.’ (1) He further quotes Donald Fleming who says that ‘reconnaissance of natural history provided the leitmotif of the scientific enterprise in the nineteenth century. These investigations flowed without a break from the combination of practical and speculative motives that triggered the colonial enterprise itself. After all, the environment had to be mastered and its economic potentialities properly canvassed.’ (2) In this regard Kumar further says that Fleming identifies some features of this brand of science, one of which is that the European scientists like Linnaeus and Banks behaved like ‘absentee landlords’ ceaselessly commanding and receiving tribute (data) from the ends of the earth…the result was that the ‘natural history man’ looked like a variant of the ‘economic man’ and not very different from an explorer, planter or colonizer. (Deepak Kumar 2-3) He further claims that as far as the scientists in the colonies were concerned, ‘they increasingly came under the purview of the official knowledge with its hierarchies, rituals etc. The state involvement, made colonial science more ‘utility oriented’. In Britain itself there had occurred a gradual shift from science-as-avocation to science-as-enterprise. In the wake of the Industrial revolution there had developed an entrepreneurial ideology of science…men who mattered began to look
for utility or result oriented science.’ (15-16) Thus one can see the shift from a Romantic conception that viewed science as a means to unravel the bounty of nature as opposed to the Victorian times when science became a handmaiden of colonial enterprise.

Coming back to Ghosh’s portrayal of Botany for instance, which was shown ensconced in the Romantic worldview as the divine play of munificence is now seen as a lucrative commodity for overseas trade. The Botanists working in India now directed their energies to the task of extracting materially beneficial products and by-products from plants. Opium, exemplifies the nadir of this obsession and in so doing had allowed economics to take precedence over every other purpose in their exploitation of natural resources. Victorian times are also the times of increased scepticism about belief in God as well as excessive religiosity. The Darwinian theory of Evolution spurred a deep scepticism about the age-old conception of a divine source of life. In this backdrop one can see how the divine bounty that was sought to be discovered through botany is replaced by a more immediate motive- that of making material advances for the Empire. Ghosh more than hints at this transition through his portrayal of scores of Botanists moving into India to discover plants that could be beneficial sources of commodities that could help spur trade for the Empire.

Another premise that is taken up for extensive discussion is the use of science as a discourse of power by the colonists. With the growing ascendency of science in Britain during the Victorian times, especially with its translation into efficient machines and industry that spurred economic growth to levels that were hitherto unimaginined and by opening new frontiers in trade and commerce, science and technology began to acquire a formidable stature. It was an era flush with the idea of progress. The innovations in science and technology had led to far reaching revolutionary changes in the British economy and society. This became a touchstone with which to evaluate other lands, more especially their overseas colonies. Science and technology became an indicator of civilisational progress. Many officials of Raj and proponents of colonial rule saw in expansion of British rule, as enough *raison d’etre* for the prolongation of colonial rule in India.’ (Baber 17) Baber further quotes a colonial administrator who remarked that ‘when India can do her own engineering work, then and only then will she be able to govern herself.’ (17). Scientific and
technological acumen became a measure of the state of civilization. Lord Curzon, who was more vocal about the importance of science in these times talked about science as a source of legitimation of the British rule. In a medical conference held in 1899 he said that ‘the British had come into India not just as conquerors but also as benefactors, bearing the gifts of their law, religion, literature and science. There might be those who questioned the value of Britain’s law and religion but about science, especially medical science there could be no doubt. Medicine alone was justification for British rule. It was built on the bedrock of pure, irrefutable science.’ It was a boon …offered to all, rich and poor, Hindu and Muslim, woman and man. Medicine lifted the veil of purdah ‘without irreverence’: it broke down the barriers of caste ‘without sacrilege.’ (Paraphrased and Quoted by Arnold 136-37)

This study, interdisciplinary in nature has drawn from rich resources of Indian history, history of science, philosophy and literature. Since one is looking primarily at literary texts, and one’s metier being literature, it has been my endeavour to put Ghosh’s novels at the very heart of the discussion. It is also owing to some rather complex characters he has delineated that this study eventually assumed the present shape. One important characteristic of the genre of novel writing is that it has the magnitude to not only showcase but subsume the complexity of lived experience. The original impulse to stay close to the text in addition to Ghosh’s nuanced understanding of historical phenomenon allowed the present study to open up the available linear model of Post Colonial understanding. The complexity of the ‘cultures of knowledge’ that it has tried to capture in this study was in the first place responding to the writer’s portrayal of the phenomenon in the complexity that he does. The study has located the science of Botany and how it was well within the parameters of responding to the idea of ‘nature’ in the first place. The centrality accorded to nature in the Romantic movement provided this study a further impetus in studying the romantic revolt as the first large scale reaction to the science and technology and its socio-cultural manifestations. It is also not far fetched to see it coming back as full ‘circle of reason’ two centuries later in the contemporary Environment movements. We certainly have moved from the divine and mystical meanings accorded to nature by the romantics but even in the classroom situations, the young minds do not take very long to understand Wordsworth’s impulse when he laments: ‘going and coming we lay waste our powers, nothing we see in nature that is ours.’
The Romantic Interregnum was a rather minority view of an alternative idea of western progress: in their worship of nature they offered a model of development that would place nature in the centre and not as the means to be unabashedly exploited in the name of material progress. The Victorian epoch with its sanguine reinstatement of progress as the ideal progressively moved further away from this understanding of nature. Exploitation of flora, fauna and natural resources became the new religion and the two chapters in this study take up this subject in great detail. The worship of nature gave way to identification of fauna for economic gains and later its refinement into processed goods (using science and technology) that bring profits that far outstrip the trade of raw plants alone.

This study can be a point of departure for attempts that can analyse other literary responses to the introduction of western science in India. Since at the heart of this study is an effort to expose the nexus between a broader ‘culture of knowledge’ to science and also the dialectics of this exchange, the complexity of thought movements and resulting ideological climate that produces scientific as well as political thought is explored. Thomas Kuhn’s theory of framing of paradigms by a given scientific community to be subsequently taken as the parameters along which the scientists engender new theorems has proved useful in understanding the subjectivity marked in scientific work. For this study the context to science has become central; the skewed power relations in a special situation like colonialism further sharpen the need to revisit the circumstances (late eighteenth century onwards) that have gone into the production, expansion and historiography of sciences. Therefore studying the literary responses from India to science was an exciting enterprise to undertake for a researcher in the areas of literature as well as Cultural Studies.

Works cited:

