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Beyond the Laboratory: Indian Knowledge System and the Limits of Western Medical Science in Amitav Ghosh's The Calcutta Chromosome

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Abstract: Amitav Ghosh, an anthropologist and novelist, is a reclaimed author and a shining star in the galaxy of world literature written in post-colonial age in English. He gained name and fame with his debut novel, The *Circle of Reason in 1986*, and has penned several novels, dealing with the numerous deep, emerging, historical and medical issues. *The Calcutta Chromosome (1996)* is a research and science novel, dealing with the Indian traditional knowledge and the hegemony of Western medical science in the colonial period in India. The novel reconstructs the reality based imaginative story of Ronald Ross's discovery of the malaria parasite by embedding it within a counter-narrative of subaltern knowledge, secrecy, and mystical traditions. This paper closely examines the text of the novel to approve the findings of Ghosh's research for destabilizing the authority of Western science by validating Indian indigenous knowledge, which encircles oral traditions, ritual practices, spirituality, and esoteric science. Murugan, an Indian born New York scientist, as the mouthpiece of the author, deeply investigates the progress of Ronald Ross' search of Malaria parasite and finds a sudden and overnight change in his track to get success by snatching the ideas from the Indian subalterns and awarded with the Noble prize for the discovery, he never did.

Keywords: Chromosome, medical science, laboratory, malaria, subalterns, traditions etc.

Introduction: Amitav Ghosh, a shining star in the firmament of world literature, is undoubtedly known as a modern novelist with postcolonial ideology because through his works, he consistently interrogates the politics of colonial history and its representation. In *The Calcutta Chromosome* (1996), Ghosh turns the pages of scientific history pertaining to the discovery of the parasite responsible for malaria by Ronald Ross in 1897 in Calcutta and was awarded with the Nobel Prize for his groundbreaking discovery, he never did. Ghosh, through Murugan, an Indian born scientist in New York, puts a question mark on the fake discovery of Ronald Ross because the real inventors were Indian subalterns who resides in marginalised and dirty slums with Indian ayurvedic and medicinal knowledge of malaria parasite, life circle and its uses for curing other sexual diseases. But the western hegemony celebrates Ross as the heroic figure to brighten the name of colonial medical science for discovering malaria transmission, while Amitav Ghosh, as a true son of *Bharat Mata*, attracts the attention of the world towards this 'discovery' that was silent contribution of Indian subaltern lab assistants – Mangla

and Laakhan/ Lachaman. The narrative unsettles the epistemic dominancy of Western science, foregrounding alternative systems of Indian knowledge rooted in secrecy, spirituality, and oral traditions. Ghosh tries his best to remind the readers that Indian knowledge system in medicine, has been rich and glorified with "Ayurveda (the life science), the oldest medical systems in the world and the practice of holistic healing which incorporates "standard" medical knowledge with spiritual concepts and herbal remedies in treatment as well as prevention of diseases without patent." (web) Ayurveda was in practice in India for thousands of years before the existence of **Greek** physician **Hippocrates** (460 - 379 BCE), who is established as the Father of Medicine.

Objective of the Research: This Paper aims at exploring the novel 'The Calcutta Chromosome' to find out the epistemic clash between Indian and western science in order to disestablish the western supremacy over Indian knowledge system in the discovery of malaria parasite and its life circle out of the colonial laboratory.

Research Method: This study assumes a critical, analytical, interpretive and comparative exploration of Amitav Ghosh's 'The Calcutta Chromosome' with primary data derived from close textual reading of the novel itself, focusing on the literary text not the biological accuracy. Secondary sources - including scholarly books, research journal articles, chapters from edited volumes, and credible digital archives - have been consulted to gather the necessary information. The research adopts a comparative approach including postcolonial and epistemological theories, for a contrasting representation of Ronald Ross as western science with Mangala/ Lutchman as Indian Knowledge.

Main Text: The Calcutta Chromosome a scientific novel based on medical research pertaining to malaria parasite in the colonial laboratory and beyond the laboratory where subaltern had already been working with the malaria parasite to treat a sexual disease called syphilis without any written record or patent. The colonialists used science as a key tool to implement and maintain their power, command and control over colonised people who were treated as their slave physically and mentally. Even their knowledge system and science were snatched away and published on the name of the colonisers. Amitav Ghosh has taken a bold step to investigate into the discovery of malaria parasite that is patent to the name of Ronald Ross, a British doctor posted in Indian government hospitals at Secundrabad, Begumpet and Calcutta respectively. He delineates an Indian Scientist named Murugan who was born in Calcutta and is obsessed with the discovery of malaria and Ronald Ross but mysteriously, he disappeared from Calcutta on the succeeding day of 20th August 1995, The Mosquito Day. It was Antar, the co-worker of Murugan in New York for the International water Council, while working on a supercomputer (AVA) that can reconstruct voices, data, images and personality of someone through digital traces, finds Murugan Identity Card and makes a conversation with him through reconstructed voice data about Malaria research by Mangala and Lakshman not by Ronald Ross.

It was the early 19th century, when malaria started spreading and was treated, the all-time biggest killer among diseases" (Ghosh 47) that had covered the complete map of the world to kill the people like the plague, small pox or syphilis. Murugan says, "There's no place on earth that's off the (47) malaria map: Arctic circle, freezing mountaintop, burning desert, you name it, malaria's been there." (47) it was very difficult to count the death by malaria because it was not in millions rather in hundreds of millions. In order to find out the cause, symptoms and treatment of malaria, the scientists from all over the world - Rome, Algeria, France, Asia, Australia, America etc. were too much worried as it was the question on the modern science and human existence. Even "Governments began to pour money into malaria research – in France, in Italy, in the US everywhere except England." (48). Ronald Ross, the citizen and military doctor of England did not pay heed to this problem but Murugan is surprised enough why Ronald Ross "at an age when most scientists start checking their pension funds" (48) for retirement, he jumped out of the bed in Sikundrabad and started research of malaria though neither his country's government paid any attention to this disease nor he was sure of success and talks to himself, "Dear me, I don't know what I'm going to do

with myself today...” (48) but he has some of his friends like MacCallum, a parasitologist who was studying the sexual stages of malaria in birds and C.F. Farley, a journalist and British Radio reporter who makes written records of the events favourable to Ross to establish him, as an International hero by hiding contributions of local people like Mangla and Lakshaman.

Ross has a colonial mindset and admits himself: “Science is the record of what is repeatable (49) hence he writes everything down… (as if) he is going to rewrite the history books” (44). In this way, Ross reduces discovery to documentation, erasing the lived and oral dimensions of knowledge. Critics such as Suparna Banerjee (2006) argue that Ghosh highlights “the complicity of science with imperialism, where knowledge is systematized in order to erase the contributions of local practitioners” (Suparna 88). In the novel, Ross is portrayed as both ambitious and arrogant, obsessed with publication and recognition: “Without the paper, there’s no discovery. Without the discovery, there’s no fame” (Ghosh 112). This obsession mirrors the colonial scientific mindset that knowledge becomes valid only when codified into the Eurocentric system of records, journals, and prizes.

Against this background, Ghosh tries to prove Indian knowledge systems as a counter-discourse. These systems emphasize secrecy, oral transmission, ritual, and mysticism. In the novel, the custodians of silent knowledge, mysticism, and rituals is Mangala, a low-caste woman, and her companion Laakhan. They represent the colonised knowledgeable persons who had deep knowledge of the causes and symptoms of Malaria and cooperated Ross as the helpers in his discovery. Their knowledge of malaria transmission supersedes the scientific mind of Ross, Cunningham and their colleagues on the path of their discovery because till 1898, Ronald Ross was able only to find out that it was transmitted from insect to insect through the reproductive cycle. He also tried to isolate the variety of mosquito that transmitted the disease. Murugan penned down an investigating summary of Ross’ search in an article in 1987 and found that Both Manson and Ross were on the wrong path and believe in ‘Malaria Dust Theory’ that the parasite causing malaria disseminated from mosquitoes to man by drinking malaria mosquitoes by mixing them in water. Though he declared “to pay real money for a few drops of malaria blood” (60), yet he was unable to find a single malaria patient to give the sample of the blood which made him almost hopeless. But suddenly, his luck works to find a malaria patient named Abdul Kadir who gave him blood sample which engages him for hundreds of days and guides him in the critical phases of his discovery. But again, he had a big problem of finding out someone to drink “cocktail from dead mosquitoes.” (62) Murugan says that Ronnie gets lucky once again because on May 25, 1895 an Indian guy called Lutchman, a “*dhooley-bearer* in other words, the British Government pays him to shovel shit” (63).

Ross had no knowledge of mosquitos’ different species and especially about the mosquito that spreads malaria. He was wandering for malaria parasite from one laboratory to another with no use. It was Lutchman who planted the idea that every mosquito is not responsible for causing malaria rather it might be one particular species of mosquito. Murugan told Antar, “Lutchman’s got him chasing after the real malaria vector. Ronnie still doesn’t know they’re called anopheles: names them “dappled-wing mosquitoes” Next day Lutchman sends him a jarful of anopheles” (66). He had to be the part of his search as a subject for experiments without thinking of his own life and death. He agrees,

> To drink Ronnie’s cocktail. Ronnie pops the corks and breaks out mosquito margarita…… Lutchman has a fever next morning: 99.8 at 8 a.m. Look’s like it’s time for Doc Manson to jump out of his bathtub; may be malaria really is spread through mosquito dust…but a day later he’s so fit, he could run the Begumpett marathon: no sign of malaria in his blood. That’s the end of the line for the mosquito-dust theory (62-63).

But overnight, Ross changed his direction and the very next day of August 20, 1897, he found the connection between Plasmodium Zygotes and Anopheles, Stephenville. Murugan finds it incredible that Ross could get success in such a short time without help of local Indians in Kolkata. His curiosity and rationality derived him to doubt at the mind of Ross, for which he is bitterly criticised by scientists. He did not discourage his curiosity and like a true son of *Durga Mata*, as described in Indian Mythology, he tries his best to earn the credit of this malaria search to Luchman and Mangla who deserve for that in reality. Ghosh writes:

> His research leads him to believe that neither Ross nor Doc Manson of the so-called 'Other Mind': a theory that some persons had systematically interfered with Ronald Ross's experiments to push malaria research in certain directions while leading it away from others (31).

Murugan, very shockingly, asks why Noble Prize was honored to a person who does not know even alphabets of malaria. Ghosh, through Murugan, throws light upon the trauma of colonialism which was a curse for all the marginal countries. Colonialism, "a system of political, economic, psychological and cultural domination of one country over the other, always spawns a pattern of cultural and political marginalization of the colonized country. It establishes a myth of intellectual, social, cultural, religious and physical inferiority of the colonized as in the case of malaria research." (web) It is a kind of effeminacy of the colonized. Ashish Nandy in his book '*The Intimate Enemy: Loss and Recovery of Self under Colonialism' (1983)* also writes about the ills of colonialism that "the drive for mastery over men is not merely a by-product of a faulty political economy but also of a world view which believes in the absolute superiority of… the modern or progressive over the traditional or the savage" (Nandy 10).

Ghosh, very scientifically and logically, shatters the delusions of grandeur of the West through falsifying Ross' claim of conducting of the discovery of the parasite causing malaria. Murugan pokes fun at Ross: "He thinks: he's doing experiments on the malaria parasite. And all the time it's he who is the experimented on the malaria parasite. But Ronnie never gets it; not to the end of his life" (Ghosh 67). Murugan argues that Ronald Ross's scientific research was actually being manipulated by "lower-class" individuals, Lutchman and Mangala. Ghosh uses magical realism and mysticism to challenge the idea that Western science though based on experiments in laboratories, is superior to Eastern knowledge that needs no laboratory. He introduces a secret religion that is based on silence, where Mangala and Lutchman, the downtrodden, hide their true identities as well as knowledge of medical sciences and use supernatural methods to conduct medical discoveries in the natural atmosphere of India. They said, "What you call secrecy, we call survival" (137). Priya Kumar (2002) notes that "Mangala and her group exemplify a subaltern epistemology that resists co-optation into the colonial archive" (Kumar 133). Ghosh writes:

> Fact is we're dealing with a crowd for whom silence is a religion. We don't even know what we don't know. We don't know who's in this and who's not; we do not know how much of the spin they've got under control. We don't know how many of the threads they want us to pull together and how many they want to keep hanging for whoever comes next (Ghosh, 180).

The novel insists that silence and secrecy is a mode of knowledge because "there are things which must not be said, not because they are false, but because they are true" (145). The narrative also suggests that people in the group of Mangla have firm faith in counter science. Murugan seems to be highly interested in the unspoken "new knowledge." According to Murugan, "The first principle of a functioning counter-science…to refuse all direct communication… because to put ideas into language, would be to establish a claim to know - which is the first thing that a counter-science would dispute" (103). Murugan also adds that this group started with the idea that knowledge is self-contradictory so "to know something is to change it, therefore in knowing something, you've already changed what you think you know so you don't really know it at all: you only know its history. Maybe they thought that knowledge couldn't begin without acknowledging the impossibility of knowledge" (88).

These Marginalised subalterns in contrast to western medical scientists believe in the importance of silence for promoting their selfless service though traditional advanced knowledge of medicine and accept it as a work for humanity. This science novel projects Indian rustic as developers of the most revolutionary technology in the field of medicine and announces that these people were much ahead of Ronald Ross on malaria research. Ghosh applies magical and fantastical realism to establish the Indian folk higher than the Western rationalism by assimilating the elements of Indian traditional knowledge that is the part and parcel of Indians out of the laboratory. A socio-medical researcher, Ajit K. Dalal makes an important observation of the native

folk practices of healing and affirms, "…freedom from pain and suffering has been a major preoccupation of Indian society since antiquity... every society has developed its own healing institutions and practices. The traditional systems so evolved have weathered the vagaries of time, and still thrive in the present times on popular support" (Dalal 19).

The main objective of Folk healing is to free people from their everyday worries and assure them to bigger life possibilities. This method is therapeutic because it links people with their history and future, the living and the dead, the natural and the supernatural, broadening their experiences. In contrast, modern science is largely a Western construct that was used by colonial powers to dominate culturally rich nations like India. A key focus for writers from the postcolonial era is exposing these manipulative tactics that Western nations used to maintain control and exploit their colonies for economic and cultural gain. The clash between the Ross and Mangala represents the clash between laboratory experiments and indigenous knowledge out of the laboratory, the rationalist ethos of Western science and the mystical, holistic vision of Indian knowledge. Ross, to earn name and fame tries to say that "science must be universal, verifiable, and open" (Ghosh, 111) while Mangala embodies secrecy and spirituality. Her knowledge operates through ritual, silence, and transformation—modes antithetical to Ross's worldview. Not only Ross but also Julius Von Wanger- Jauregg won the Noble Prize in 1927 for the discovery which was done in India by Mangala and Lutchman i.e. artificially induced malaria could cure syphilis, a sexually transmitted disease. This group is led by mysterious Mangala who also suffers from syphilis, played very significant role to find out the parasite responsible for malaria in 1890s and had evolved a specific malaria bug that was cultured in pigeons and these infected birds helped in successful curing for syphilis. It was observed by Farley himself. He describes Mangala's activities in details:

> First the assistant went up to the woman, Mangala still regally ensconced on her divan, and touched his forehead to her feet. Then in the manner of a courtier or acolyte, he whispered some word of advice in her ear. She nodded in agreement and took the clean slides from him… she reached into a cage, and took one of the shivering birds into her lap… her mouth began to move as though muttering a prayer. Then suddenly a scalpel appeared in her right hand; she held the bird away from her and with a single flick of her wrist beheaded the dying pigeon. Once the flow of blood had lessened, she picked up the clean slides, smeared them across the severed neck, and handed the, to the assistant (127).

Murugan is committed to bring the credit of the discovery of malaria and the treatment of syphilis to the right people so he investigates each and every minute point related to Ross, Farely, Mangala, and Lachman. It is the letter of Farely that clarifies the authenticity of the activities of Mangla who uses malaria bug for the treatment of syphilis that was untreated disease before the discovery of penicillin (1928) and it caused death of millions of people every year all over the world. While Mangala has its authentic treatment without written record or patent so people from a long distance came there for their treatments. Though they believed. "She was a witch or a magician or a god or whatever: it doesn't matter – the conventional medical treatment for syphilis at that time weren't much more than hocus-pocus either" (204).

She apparently utilized an unconventional, rudimentary breeding technique to produce a unique malaria strain capable of growing within pigeons. A renowned contemporary critic J.D. Soni writes, "The very mystery in the novel is that it allows the reader to dig deep to have new and many more new layers of meaning. Undoubtedly, it is a good beginning of a new trend yet to be adopted by young fiction writers of today" (Soni, 41).

Conclusion: The Calcutta Chromosome is not simply a novel about science; it is a profound investigation into the colonial politics of marginalising Indians and usurping their traditional and mythological knowledge for scientific search and publishing them with their own name to get name and fame in the world as Ronald Ross and Julius Von Wanger- Jauregg won the Noble Prize for the discoveries done by Indian rustic people.

By juxtaposing Western rationality with Indian mysticism, Ghosh demonstrates that epistemologies are culturally situated and historically contested. Through the characters like Mangala and Laakhan, Ghosh tries his best to earn credit of discovery to Indian systems of knowledge that are oral, secretive, and spiritual. He writes, "The truest discoveries are the ones that cannot be told" (Ghosh 211). This statement encapsulates Ghosh's vision: knowledge is not always reducible to text, experiment, or documentation. By reclaiming indigenous epistemologies, The Calcutta Chromosome rewrites the history of science and opens up critical spaces for rethinking the politics of knowledge in a postcolonial context. In true sense, Ghosh writes a counter-history of science - one that decanters the European subject and acknowledges the epistemological richness of Indian traditions by repositioning Ronald Ross as a mere pawn of a sophisticated, subaltern underground. Through the figure of Mangala, he validates an indigenous epistemology that masters biological transference and genetic secrets through ritual and silence out of laboratories.

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