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Pramod K. Nayar

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## **Abstract**

Amitav Ghosh's *The Calcutta Chromosome* (1995) is a novel about the informational economy. The novel proposes a new kind of subjectivity that is, in Katherine Hayles's terms, a cross between the 'materiality of informatics and the immateriality of information' (193). It could also be read as a cyberpunk novel with its themes of information, networks, codes, bodies and posthuman identities.

PRAMOD K. NAYAR

## The Informational Economy and Its Body in Amitav Ghosh's *The Calcutta Chromosome*

Amitav Ghosh's *The Calcutta Chromosome* (1995) is a novel about the informational economy. The novel proposes a new kind of subjectivity that is, in Katherine Hayles's terms, a cross between the 'materiality of informatics and the immateriality of information' (193). It could also be read as a cyberpunk novel with its themes of information, networks, codes, bodies and posthuman identities.

*The Calcutta Chromosome* opens in early twenty-first century New York. Antar, a reclusive Egyptian, works for the International Water Council (which seeks to privatise the world's water resources), and is assigned to a supercomputer Ava, whose task is to inventory lost objects while seeking potentially useful information. Antar discovers the story of Murugan when his ID Card turns up on Ava. Murugan, a former colleague of Antar's (they were together at an organisation called LifeWatch, which was absorbed into the International Water Council), had disappeared in Calcutta in 1995. Antar begins to put together information about Murugan and discovers that he had quit his LifeWatch job in pursuit of his obsession: to trace the history of the quest for the malarial parasite in British India. Ghosh merges the narrative timelines of nineteenth century India and Ronald Ross's quest for the malarial pathogen, with Murugan's 1990s Calcutta and Antar in the twenty-first century.<sup>1</sup>

Antar is the sole survivor of a very mysterious malarial outbreak in his remote village in Egypt. Murugan had been certain that British investigations into malaria in colonial India had been closely monitored and indeed interfered with by an Indian cabal. Ross's predecessors like Farley, the American malaria scientist-turned-missionary doctor who comes to India in the 1890s, and the British army doctor and malaria investigator D.D. Cunningham, had been manipulated. Murugan hypothesises that Ross too was led to his discovery of the malarial parasite – the anopheles mosquito – by this cabal which is headed by a mysterious woman, Mangala, a cleaning woman in Cunningham's clinic. Mangala, who is syphilitic, chances upon a medical discovery: the malarial parasite might be used to regenerate the brain tissue decaying in the last stages of syphilis. In the course of this discovery, Mangala and her group stumble across a strange 'chromosome', the 'Calcutta chromosome'. This is the biological equivalent of the human soul, and is a chromosome 'only by analogy' (Ghosh 247). It resides in brain tissue and

survives by mutation. Mangala's group discovers that the malarial parasite can splice DNA, and therefore, they speculate, could be used to transmit the Calcutta chromosome so that the decaying brain may be regenerated in a syphilitic patient. The cabal believes that immortality could be ensured when the Calcutta chromosome is transmitted into another person. Thus, while Ross searches for the nosology, etiology and vectors of malaria, the 'natives' have an entirely different project: the transmigration of personalities and souls into new bodies through the transmission of the malarial parasite. This group also believes that in some forms of knowledge, the minute one 'knows' anything, it changes its form. The group therefore believes that once Ross discovers the malarial parasite, it will change. In order to monitor Ross's experiments, the group constantly supplies him with assistants and aides. Antar discovers that members of this group — mainly Mangala and Lakhan — have appeared in Calcutta's twentieth century history in many forms: Urmila (a journalist to whom Murugan reveals the story of Mangala and the cabal), Sonali Das (a journalist and movie star), the self-made man, Romen Halder, and the cook that Tara (also, perhaps, an incarnation of Mangala) hires.

*The Calcutta Chromosome* juxtaposes the so-called rationality and scientific rigour of the colonial Ronald Ross with the quasi-religious experiments of Mangala and her cabal. It suggests that Ross's experiments were actually Mangala's, and Ross had been roped in only because the cabal needed to take a next step in the process of uncovering how genes work. The novel also suggests that the colonial quest for the malarial pathogen was a minor moment in the larger 'native' project: reincarnation and immortality.

Criticism of *The Calcutta Chromosome* has been dominated by an interpretation of the text as a postcolonial science fiction tale that positions folklore and 'native' knowledge in antagonistic relationship with colonial science where the discoveries of Western scientists are rewarded and 'native' efforts dismissed as unscientific.<sup>2</sup> In such interpretations, *The Calcutta Chromosome* is seen as deromanticising the efforts of the colonial doctor-hero Ross. By showing how Ross 'never realizes he is being manipulated', Tuomas Huttenen argues, Amitav Ghosh 'assigns agency and power to the subaltern groups' (36). Colonial laboratories such as those in India peopled by Ross, Farley and Cunningham, are places where the logics of colonial science are *overturned* by 'native' cultures of healing like Mangala's. The novel thus asks: who takes the responsibility for the discoveries in the laboratories? In Nelson's reading, Ghosh problematises the very idea of a white man's discovery — a discovery that was made possible by a network of 'native' actors (254). Others treat it as a novel exploring the possibilities of posthuman futures where increasing human-computer interfaces and forms of embodiment will redefine the very ontology of human beings (Shinn). Calcutta is the colonial city, Ghosh suggests, where more than individual transmigrations of souls and personalities occur: it is the site where massive crowds gather, and a collective transmigration occurs (Thompson), or the very idea of dwelling is inverted (see Romanik).

On the contrary I want to argue that Ghosh's novel is about information. Starting with the random piece of information — Murugan's identity card on Antar's screen — through the messages, DNA (itself an informational code), puzzles and stories to misrepresentations and decodings, Ghosh traces the multiple, complicated and messy traversals of information. In this essay then, I attempt to unravel the informational economy and its structures of information-gathering, codification and dissemination and the 'body of information' produced as a consequence in Ghosh's novel. It argues in the first section that the materiality of information — bodies, laboratories, chromosomes — intersects with the 'immateriality' of information. The informational economy in the novel is the embeddedness of forms and modes of colonial information-gathering in 'native', anti-colonial and counter-science contexts, which therefore render the information gathered authentic, suspect or altered because the context determines the validity of the information. In the second section I examine the 'body' of information, where the signs, inscriptions and codes of the informational economy are incorporated and merged with(in) a body, showing how the information economy of colonial medical research and anti-colonial science both take recourse to embodiment to instantiate information. In the last section I trace the emergence of cyborgs, where informational economies collide and result in new species-blurring bodies that are posthuman.

#### THE INFORMATIONAL ECONOMY

In our contemporary world the materiality of informatics is the actual infrastructure that enables the creation, packaging and dissemination of information. It refers to the hardware, the concrete buildings and other physical topographies wherein information is located, generated and codified into suitable bytes to be retrieved by computers. In *The Calcutta Chromosome* a lot more than hardware and concrete make up the materiality of informatics. What I am identifying as the 'informational economy' is the set of structures — material, hardware, human bodies — that enable the collection, codification and transmission of data. This informational economy is colonial and anti-colonial, ancient, with its own forms of codifying and transmitting information, and very contemporary. It consists of the Valentinian cult of silence (named after the 2nd century AD Alexandrian gnostic philosopher Valentinus and founded, according to the novel, on two key aspects, the Abyss and the Silence, where one is male and the other female, one is mind and the other truth) in an age of colonial science, the situated knowledges of 'native' cultures, and the high-speed information transmission of the globalised cybercultural era. In this section I examine the informational economy — the material structures, hardware and 'bodies' in *The Calcutta Chromosome* where information and bodies conflate and rewire each other.

The opening lines of *The Calcutta Chromosome* refer to the material dimension of information:

If the system hadn't stalled Antar would never have guessed that the scrap of paper on his screen was the remnant of an ID card. It looked as though it had been rescued from a fire: its plastic laminate had warped and melted along the edges. The lettering was mostly illegible and the photograph had vanished under a smudge of soot. But a four-inch metal chain had somehow stayed attached... It was the chain that tripped the system, not the card. (3)

Ghosh is discussing information here — an individual's identity card. But the narrative forces the reader to focus on the material manifestations of this information: a card, its physical features, a screen on which it appears, a system that carries the image, a photograph. Finally, it is not the information that stalls the system but the metal chain. It is the very material basis of information that generates a request for more information and stalls the information process.

The materiality of informatics in *The Calcutta Chromosome* includes the computers and their hardware, the malarial mosquito, the parasite's body, Murugan's and other malarial patients' bodies, Antar, Laakhan and Ross. (At one point it even involves other bodies: such as the pigeon, whose blood is delivered as a specimen for Farley to investigate the pathogen/vector, 151). The devious plot of the novel complicates this too. Information is collected by Ross about the medium of transmission of the parasite, which consequently results in changes in the parasite. Mangala discovers the secret of malarial information-transmission, only to realise that she needs another body (Ross) to decode it.

The third paragraph of the novel informs us of the material objects in the inventorying process that often stall the computer: a glass paperweight and a bottle of correcting fluid (3–4). The point is one of irony: that older forms of technology, such as type-writing and identity cards stall a sophisticated computer like Ava. Ava, which can render any phrase in 'the world's languages in declining of order of population' (7), is bogged down by details, by an excess of information being processed about material objects. Ghosh writes: 'Anything she [Ava] didn't recognize she'd take apart on screen, producing microscopic structural analyses ... producing ever greater refinements of detail' (4). I believe Ghosh sets in motion here the two key components of his tale: the material contexts and conditions of information and the 'immaterial' (because it is electronic) nature (and quality) of information itself. A material object generates interminable data flows about perhaps trivial particulars. The information gathered by Ava is akin to what the young Antar had said about the European archaeologists in his village in Egypt: they count dust particles, they are 'dust counters' (6) — a term he also uses to describe Ava (7). Ghosh shifts focus from the materiality of information flows to the unending flow of irrelevant, and therefore 'immaterial', information.

Later Ghosh juxtaposes two materialities of information. The narrative shifts to 1995 and relates the story of Murugan, the intrepid explorer on the track of Ronald Ross and his bumbling experiments with the malarial parasite. Murugan is in Calcutta when he comes across the Ross memorial inscribed with a few lines of verse (40–41). He laughs at the pompous inscription because he believes

that Ross was deliberately led by Mangala's cult to the discovery of the malarial parasite, and he is astonished and amused by his self-confidence and sense of achievement. The memorial (consisting of a medallion and Ross's 'bearded head in profile') is part of the materiality of information. Both medallion and memorial are material *commemorations* which celebrate the scientist and his discovery, and impose upon the world the myth of his genius. This monumentalisation of a 'discovery' which may not even have been Ross's discovery is, according to *The Calcutta Chromosome*, the irony and contradiction at the heart of Western science. While the achievements of Western scientists working in Indian laboratories is commemorated, the exploits of 'native' folk medicine and science, are rendered silent: there is no *information* about Mangala and her cabal in the novel's documented history of discovery. Mangala, as Suchitra Mathur notes first appears in the novel as a figurine that Murugan picks up. She is situated at the periphery of the colonial laboratories, (133–34.) Inspired by the pomposity of this memorialisation of Ross, Murugan takes it on himself to reveal the real story behind the quest for the malarial parasite. Immediately after his discovery of the memorial, he also discovers the figurine that will eventually be revealed to the reader to be 'Mangala-bibi' (42–43). Two oppositional and material — because they are in the form of statues/memorials/figurines — narratives appear here: the first Ross memorial (to which flawed information is attached) and its counterpart, the Mangala-bibi figurine that memorialises 'counter-science' and the 'native scientists' represented by Mangala.

It is important to note that even before the details of the Ross plot are revealed in the narrative Ghosh provides material clues to historical events surrounding Ross's work. The monuments, memorials, photographs and documents described above are material carriers of information, and it is the nature of this material that becomes the key point of *The Calcutta Chromosome* because the material-medium changes the information as it passes it through.

At this point it will be useful to situate the theme of the materiality of informatics within contemporary biomedical technoscience and newer concepts like 'biomedia'. *The Calcutta Chromosome* has as its central theme, bio-informatics: the interface of biology, information (where even biology is essentially converted into information that computers process, but also the DNA which is the information code for biological traits) and modes of transmission. Ghosh is writing in the immediate aftermath of massive bio-informatics projects like the Human Genome Project and the Visible Human Project. The first seeks to discover the genetic basis of all human characteristics, and to decode the genetic databases of all known human groups, ethnic and tribal identities ([www.ornl.gov/sci/technology/human\\_Genome/](http://www.ornl.gov/sci/technology/human_Genome/)). The second prepares a digital anatomy, where the human body is rendered into datasets that one could explore and navigate through a computer interface ([www.nlm.nih.edu](http://www.nlm.nih.edu)).<sup>3</sup> The body is transcoded<sup>4</sup> into the language of genetics and computers, and the result is digital humans,

bio-informatics, computational biology and, not the least, genomic art. Eugene Thacker defines biomedica as the ‘technical recontextualization of biological components and processes’ (13). The body is a medium where the media (computers, genetic codes, databases) themselves are indistinguishable from the biological body. The transcoded body here needs to be understood in two ways — as a biological, molecular, species body and as a body that is compiled through modes of visualisation, modelling and datasets.

As the novel proceeds information is shown to be not only mediated by the body: information *is* the body. Murugan exists in the form of fragmented information — primarily as a set of data in the form of his identity card and scattered references in cyberspace arriving via Ava on Antar’s screen but also as Antar’s vague memories of meeting him many years ago. The mysterious ‘Calcutta chromosome’ that Mangala and her cabal are trying to unravel is a special one: it keeps altering its coat-proteins. Murugan points out to Antar that the key point is not so much the chromosome as its methods of ‘transmission’. The chromosome is particular to every individual, it is not inherited from the immediate gene pool nor is it transmitted into it. It is not transmitted by sexual reproduction, yet it requires a body, preferably a human one, for onward transmission (246–49). Bio-information clearly requires a body for transmission, the only problem being that the information is modified in every body, even as the body is itself rewired — this is the ‘secret’ of the Calcutta chromosome. The malarial parasite carries its genetic code into the host, alters itself, and cures syphilis but rewires the brain — the epicentre of information-processing — of the host. This rewiring is what enables the transmission of a personality into another body (a form of interpersonal migration of souls), and is the focus of Mangala’s efforts. The parasite is the vehicle upon which personalities can cross over into other brains/minds in the form of information codes.

This is the principal variation on the bioinformatics theme: in bioinformatics data must be capable of being transmitted between molecules and bits, but the genetic data must remain self-identical in a variety of research-based contexts (Thacker 45). *The Calcutta Chromosome*’s postcolonial politics is about the research contexts in which the data alters with the context. Its key theme is the creation, packaging, transmission and reception/interpretation of data. The ‘creation’ of data is of course linked to the contexts (including bodies) in which it is produced. The source of information, its mechanisms of transmission and the contexts of its interpretations are also infused with the same postcolonial politics and may be summarised as a series of questions the novel raises: who produces the information? How is it packaged? For what purposes is the information sought? Who is authorised to interpret the information as adequate or inadequate? Murugan’s theory about Ross’s discovery is that the Western scientists may have sought specific information about the malarial pathogen and vector, but it was the ‘native’ cabal working invisibly alongside Cunningham, Farley and

Ross, that directed the colonial scientist's gaze to the correct data. Though it is the colonial scientist who makes the pronouncements regarding the disease, his information is gleaned from carefully placed clues. The patient-bodies from which the information about the disease is gleaned are also 'native', and even turn up fortuitously in Ross's laboratory as Abdul Kadir (70–72) or Lutchman (73–74). The entire link between bodies, the data about the bodies, the observational techniques and the conclusions is manipulated by the 'natives' — and this is the postcolonial politics of information itself. Over and beyond this, Ghosh also offers a theory of knowledge through this politics of information.

Explaining the conspiracy he has unravelled about Ross's discovery, Murugan proposes a whole new theory of knowledge-making. Murugan informs Antar that to know something is to change it and what you know of something is only its history (104). In short, any 'knowledge' is the history of what was investigated and decoded, but which has changed since the investigation and decoding. It follows that the information being studied becomes something else the minute it is understood. Only the contexts can be known, the archives, in which information was acquired or studied. Murugan suggests that Mangala and her team wanted the knowledge of the parasite to develop along specific trajectories and contexts. If they believed, Murugan suggests, that to know something is to change it, then it should be possible to effect a desired change by knowing *something* about the object of study. If they want the malarial parasite to change into a means of interpersonal migration — which is their project, according to Murugan — then some changes need to be effected in the parasite. These changes ('mutations', as Murugan calls them, 104) are what they have Ross effect by directing his information-gathering inquiries along certain routes. This is where Murugan maps the informational economy of the parasite and of the scientific inquiries into the pathogen.

Murugan admits that the 'natives', headed by Mangala, needed the Western scientist:

They've run smack into a dead end: they're stuck, they can't go further — because of the glitches in their own methods, because they just haven't got the right equipment ...

The question now is: how do they speed up the process? The answer is: they've got to find a conventional scientist who'll give it a push. (104)

Ross is no brilliant pioneer, he is the 'conventional scientist' the 'native' cabal is looking for: he is an instrument of knowledge-making in its hands. The mutation in the parasite, then, is the very process of Western science's inquiries into it. Mangala, therefore, needs Ross to 'figure the whole thing out and publish it ... once the life cycle had been figured out it would spontaneously mutate in directions that would take *her* work to the next step' (249, [emphasis added]). Ross's understanding of the information and the parasite would cause it to change and enable Mangala to further her studies. This is the well-organised informational economy — where Western science's access to and control over information is manipulated by 'native' cabals — in which Ross has to work.

It is this informational economy that is the context of information-gathering, transmission and reception, where information can never be pure. Ross's information about the pathogen and its vectors is contaminated because of its location within the informational economy built by Mangala and the cabal, even though Western laboratories and sciences have contributed to it. The presumed success of Ross in acquiring reliable information is undermined by the emphasis on the role of 'native' manipulation: Ross is just a *body* who is manipulated into seeking information in patient-bodies, which are themselves supplied unobtrusively by 'natives' interested in particular directions in his research. His own research results in no real (material) consequences: his raw material (bodies) and important (material) information can emerge only within a 'nativised' informational economy.

There are other, material and networked 'bodies' central to the transmission of information (about the parasite, people or anything else): Farley, Cunningham, Phulboni and even the railway station. Railway stations are of course critical nodes ('actors') in communication-transportation networks. As Nelson points out, the colonial laboratories in *The Calcutta Chromosome* 'link actants — humans and non-human — into networks' (253). In the novel, railways, organic bodies, institutions, computers are all nodes and conduits for the transmission of information. The Renupur railway station is the key transaction-translation point involving the mysterious Laakhan. Farley is last seen alighting there (153). Grigson, the linguist, has a near-death experience at a railway station (93). Antar walks to Penn Station on a regular basis (13). Antar hails from a small hamlet in Egypt, whose population was wiped out through a malarial epidemic: young Antar, the sole survivor, was seen at a railway station near his village (203). Phulboni loves trains (254), and has a near-death experience at Renupur station (271, 276). That it was Cunningham — the man behind Ross — who had some self-altering experience in Madras is known only through one piece of evidence: he had been in Madras during a particular week. The information about his critical dis-location comes from a railway reservation chart (104, 176). Laakhan first lives at the Renupur railway station and then at Sealdah (278). Cunningham finds all his assistants at the Sealdah railway station (145). The railway station — a very material context, if any — is a junction where trains are switched (in fact, these are deliberately switched, to murderous effects). But they are also points at which information is exchanged, routed and transmitted. Colonial scientists — bodies — are rerouted along paths the 'natives' want them to travel. Trains and packets of information are switched at railway stations which therefore become major actors in the informational economy.

The 'old' informational economy is the organisational structure of colonial medical research, but it is also the informal 'laboratory' that Mangala runs (ironically, right next to Cunningham's). Mangala is a cleaning woman in the laboratory and Laakhan/Lakhan another assistant in it. Yet they both exhibit remarkable prescience: Farley discovers that Mangala and her assistant choose

the specimen slides for Cunningham. He ponders: 'how was it that she, evidently untrained and unaware of any of the principles on which such knowledge rested, had come to exercise such authority over the assistant?' (143). The entire structure of the colonial laboratory, Ghosh suggests, is manipulated and turned to their own purposes by the 'natives'. The politics of medical research — of 'trained' knowledge, for example — are subverted by the 'natives'. When Farley asks Cunningham how he could hire untrained assistants, he pompously declares that he had trained her himself (145). Ghosh however makes it clear that the colonial laboratory trained no 'natives'. The colonial laboratory is only one node in the science network which also consists of alternative 'laboratories' such as Mangala's.

The 'new' informational economy consists of LifeWatch, Murugan and Antar's former employer, and the International Water Council, Antar's present one — all global organisations relying heavily on electronic mail communications (11–12). As the novel moves to its close, Ghosh demonstrates how the new informational economy reworks older 'bits' of information and produces new versions of older stories, myths and humans (I shall return to this toward the end of the essay). And, like the colonial one where 'natives', Englishmen, railway stations and multiple ways of knowing were linked, the new one is also made up of what Claire Chambers identifies as 'nodes and networks' where 'places and events which seem to bear no relation to each other are in fact linked' (2009 45–46).

### THE BODY OF INFORMATION

Katherine Hayles identifies two polarities of the body in the informational economy: the body and embodiment. The first is an ideal and a norm relative to a set of criteria. The second, embodiment, is always contextual, 'enmeshed within the specifics of place, time, physiology, and culture' (196). Embodiment has many variations, particularities, and abnormalities. In order to understand embodiment in the informational economy of *The Calcutta Chromosome*, I take recourse to the two principal modalities of the body outlined by Hayles: inscription and incorporation (198).

Inscription is normalised and abstract: it is a system of signs and their significance derives from the concepts they express and not from the medium in which they appear. Incorporation can be explained using an example. A practice such as the Indian form of greeting, 'namaste' (where one greets with palms together held chest high), cannot be separated from its embodied medium. It exists only when it is instantiated in a particular pair of hands making a particular kind of gesture. Incorporated knowledge is achieved through repeated use of the body in particular practices, where an action is converted into bodily memory until it becomes habitual. It is obvious that the embodied gesture of the namaste is in constant interplay with inscriptions that abstract the practices into signs. It is the interplay between inscription (signs, concepts, abstractions) and incorporation (embodied practices) that constructs the 'body of information' in *The Calcutta Chromosome*.

Incorporated knowledge retains improvisational elements that make it contextual. Incorporated knowledge is sedimented into the body: is resistant to change and it is habitual. When changes in incorporated practices take place they are usually connected to new technologies that affect how people use their bodies and experience space and time (Hayles 205). I will now look at the new technologies that *The Calcutta Chromosome* describes, and the triangulation between inscription, incorporation and technological materiality.

*The Calcutta Chromosome*, as noted above, was written around the time the body was becoming a set of data-bases in genetic, molecular and digital forms. In the novel the body is itself a recorder of data. For example, Murugan's describes the symptoms of syphilis writ on the body (lesions, scabs, sores, loosening of teeth, etc) as signs of his past (284). On the one hand, in the new informational economy of genetic testing, gene databases such as the Human Genome Project, convert the body into mathematised data for computers to code (bioinformatics). Here the technology incorporates the corporeal body into itself. On the other hand, the history of the individual is not only in his/her computerised database but writ as signs on his/her body. The 'native' cabal's project is aimed at discovering whether technology can facilitate the merger of bodies by transposing data from one body into another (data which Murugan calls the Calcutta chromosome), so that personalities can be exchanged. Technologies could be invented that make use of incorporated practices (bodily behaviour, practices, features) that are then transmitted into new bodies. This complicated intertwining between inscription and incorporation is explained by Murugan when he expounds his theory of the Calcutta chromosome to Antar.

To demonstrate this Murugan screams first at the waiter, and later at Antar, eliciting different responses from the two men. Turning to an astonished and angry Antar Murugan says:

Same stimulus, different response: he says tamatar and you say tamatim. Now think, what if the 'im' and the 'ar' could be switched between you and him? ... You'd have him speaking in your voice, or the other way round. You wouldn't know whose voice it was. (107)

Murugan takes the *signs* of fright and anger — inscription — in the waiter and Antar, that point to the incorporated knowledge (bodily knowledge on which the biologically stimulated psychological response is based) of a frightened or startled body, and speculates on the possibility of transmitting this knowledge from the waiter to Antar or vice versa. Can the incorporated knowledge of responses to stimuli — such as the waiter's or Antar's — be transmitted? Can the contexts of responses — the bodies — be altered? Can one body's response, which would bestow it meaning for the listener/viewer, be shifted into another's so that the meaning might change (since meaning is context-specific and not reliant only on the words)? Is there a technology through which 'information [by which he means bodily practices, behaviour, attitudes] could be transmitted

chromosomally, from body to body'? (107). This, he says, is what the Mangala group was seeking to find. Is there a transmissible code in our bodies? Is there, in other words, a transmissible Calcutta chromosome, a code for transmitting incorporated information into another body?

The code is a sign. It works as a concept, an abstraction. The code is encrypted and carries information. It is, in effect, a normative concept signifying secrecy, information and transmission. The chromosome is an instance of such a 'sign', more significant for what it represents than anything else. Murugan's use of the term 'chromosome' treats it as a sign of something else (in this case, the entity that 'embodies' the human personality). To shift time frames, the 'body' that Ronald Ross seeks is one that would be coded as a malarial patient. This is a normative body, an abstract or typical body — a particular kind of body that exhibits certain symptoms. The normative body here is one inscribed as, given the sign of, 'the malarial body' or 'vector'. Further, the 'body' of the malarial mosquito is also normative because Ross has no idea about the different species of mosquito. He only seeks *a* mosquito body. In each of these three cases we have inscription employed as a normative and abstract concept. There is a normative idea among the English researchers of what constitutes the pathology of malaria, or a patient-body. It is this typical patient-body (human) and vector (mosquito) that Ross seeks. This means that a model of the patient-body and vector is already coded into the research project (what we can think of as the normative body). It is inscribed with the sign, 'malarial body'. However, Mangala and her team subvert the English researchers' practices by directing their efforts away from what they (the English) believe to be typical malarial bodies towards other bodies — humans and mosquitoes — where the pathogen and the vectors can be found. In other words, Mangala and her team reject the colonial inscription of the malarial body by offering another in its place.

It is the assistant Lutchman, says Murugan, who 'succeeds in planting a crucial idea in his [Ross's] head: that the malaria vector might be one particular species of mosquito' (76). This bit of information is the 'little seed' (76) that begins to take root in Ross's mind. It is the planting of information — a body of information about the specific mosquito — into Ross that marks the 'native' intervention into Western science. Ross's ideas about the pathogen or the malarial body are reversed — or redirected — and he begins to look elsewhere for the 'right' bodies with more accurate information.

*The Calcutta Chromosome* shows how inscriptions are in tension with incorporation. Inscription in the informational economy requires and 'produces' a body, what I am calling a 'body of information'. One of the premises of *The Calcutta Chromosome* is that information requires manifestation, or embodiment. What is significant about this inscription-to-embodiment is that embodiment is always context-bound and situational. That is, the information or inscription is appropriated and manifests in particular contexts, whether colonial medicine or the contemporary cybercultural era.

The Calcutta ‘chromosome’ carries information, which can be transmitted from person to person. It is a chromosome ‘only by analogy’ (247) because it is not the usual chromosome and cannot be found through existing research procedures, but is definitely a packet of information found in certain kinds of tissue. Information in any chromosome would be manifest in the form of a new body, and it is the case with the Calcutta chromosome as well. It could be a mode of ‘crossover of randomly assorted personality traits, from the malaria donor to the recipient’ (246). This crossover, which is now random, is what Mangala and her acolytes seek to control, according to Murugan. It is important to control the information and its transmission so that its embodiment (those into whom the information is transmitted) can be manipulated. Tara (who is Urmila in a new incarnation), Mrs Aratounian, Romen Haldar (the self-made man who is perhaps the newest version of Lakhan), the Tara’s cook-boy, Urmila, Sonali Das and Antar are also embodiments of the code in new contexts. They embody the information coded into and as the Calcutta chromosome.

The body incorporates information — of new contexts and technologies (in this case, the use of the keyboard and Ava by Antar) — and works accordingly. The responses, Murugan argues, could be deliberately coded into the body so that the body would hereafter work/respond in certain ways. The ‘new’ body would be what he calls a ‘fresh start’ (107). The new body could be made to work in certain ways, just as malaria was injected into people so that their bodies reacted in certain ways. *The Calcutta Chromosome*’s complexity is such that embodiment is achieved at several levels.

Ross embodies the mis-information deliberately transmitted to him. Murugan’s language when he describes Ross indicates the results of this embodiment: he has become naïve, blundering, school-boyish (69, 75). Abdul Kadir, who walks into Ross’s laboratory embodies the malarial disease deliberately given to him (70–72). Murugan embodies a syphilitic body that has a scrambled brain. Phulboni, Cunningham and Grigson are recipients of selective bits of information and whose personalities are therefore controlled by Mangala and her group. When Grigson elicits information from Lutchman, he does so surreptitiously, by analysing the latter’s language and declares: ‘Can’t fool me ... I’ve got you natives figured’ (92). For this information, Grigson comes close to losing his life (93–94). The ‘natives’ do not allow the English free access to any information: this is the informational economy in which all colonials are trapped. Any information they do not approve of also disappears: Farley’s crucial letter regarding developments in malaria research goes missing (119).

Both ‘sides’ (Ross, Cunningham, Farley and Grigson on one, Mangala and her company on the other) have embodied information. Finally, there is Antar, Tara, Urmila, Sonali and Romen Haldar who are all embodiments of the experiment that has been in progress for a hundred years. The chromosome has been transmitted through a series of embodiments that affects personalities. The ‘body

of information' is located in the interplay between the sign (the chromosome) and the embodied state, owing much to both, but not restricted to either. The body takes on meaning in the moment of instantiation — the gesture, the behaviour, the obsessions. In Murugan's case for example, it is hinted that he himself has been engineered to undertake the quest for an alternative history. His obsession (itself, perhaps, the result of the Calcutta chromosome inside him) leads him to uncover the mysterious parallel medical research of Ross's era — research that may have happened entirely in Murugan's mind. But when he himself catches a malaria-like fever, and then discovers the clearly planted test-tube (158), perhaps carrying the pathogen, in his room, his fevered body *instantiates* his belief about the covert research project running since the 1890s. It is in the course of his delirium that he sees himself as 'one of them ... lying on a hard hospital charpoy [cot] ... watching the English doctor uncork a test tube full of mosquitoes into his net' (155). His body, like Lakhan's or Abdul Karim's in Ross's era, is inscribed as a 'patient body' in the present. The transmission of the disease is accompanied here by the transmission of the Calcutta chromosome that remakes Murugan as a version of Lakhan or Karim. (Ghosh however leaves it uncertain as to whether Murugan really catches malaria or dreams he catches it.)

The two informational economies — of colonial medicine and contemporary global information society (embodied in the supercomputer Ava and the electronic linkages that Antar traverses) utilise the very structure of their economies to instantiate specific information. Colonial medicine's informational economy is altered, driven in certain directions, by the embodied information that is Abdul Kadir, Laakhan, Ross, Cunningham and Mangala. Contemporary society's informational economy is appropriated by Mangala when she reappears as Urmila, and perhaps as Sonali and Tara, to further Murugan's work in unravelling the alternative history of malarial research. Towards the end of the novel, Antar discovers that 'somebody had begun loading the SimVis system at about the time that Ava stumbled upon Murugan's ID card' (306). Both informational economies are altered by information — inscription — that is instantiated in bodies.

*The Calcutta Chromosome* asks the reader to look at new forms of subjectivity that emerge in the technologies of inscription — the genetic code — and the contexts of embodiment — colonial Calcutta, 1990s Calcutta and twenty-first century New York. Inscriptions are instantiated through embodied actions in particular contexts. The 'body' may have been normative once. It is not so any more, being an embodiment of various techniques and practices of information gathering and dissemination. Ghosh's novel calls attention to the practices not only of information-gathering but the contexts of its interpretation. It proposes that information itself is 'immaterial' until the contexts and communities assign values to it. In this case, *The Calcutta Chromosome* demonstrates how anti-colonial resistance achieves subversive effects through the manipulation of embodied information. Mangala's team literally 'directs' Ross's research by

manipulating the ‘bodies’ (mosquitoes, pigeons, the parasite itself, and patients) for him to ‘discover’ the pathogen and the vector. By manipulating bodies within the colonial laboratory they also manipulate the information they want him to find.

### CYBORG BODIES

So far I have proposed that *The Calcutta Chromosome* represents an informational economy where the materiality of informatics crosses with the immateriality of information to construct a ‘body of information’. What kind of body is this ‘body of information’? Does it have a specific form? Does it encode a particular kind of subjectivity and identity?

It has been suggested that *The Calcutta Chromosome* could be read as a cyberpunk novel because of its concerns with technology, the body, the Gothic settings, the obsession with information transmission and mythography.<sup>5</sup> Cyberpunk’s chief feature is of course the cyborg body. *The Calcutta Chromosome* presents some of the more iconic features of cyborg bodies.<sup>6</sup> Donna Haraway describes the cyborg as the ‘site of the potent fusions of the technical, textual, organic, mythic, and political’ (24–25). It transgresses the boundaries between the human and animal, the physical and the non-physical and finally, between the organic and the machine. In *The Calcutta Chromosome* many bodies are ‘cyborged’ in the terms that Haraway describes. Antar’s life is a wired one, forever under surveillance by Ava, and constantly connected to the non-space of cyberspace and simulated reality through SimVis (Ghosh’s term for simulations of reality). Murugan eventually comes to exist only in cyberspace, turning up on Antar’s screen as a ‘body’ experiencing what the novel calls an ‘alternative state’. In both these cases the body is cyborged — networked, wired and altered through insertion into the machinic universe.

The textual is central to the narrative’s construction of cyborged bodies. Antar, is drawn into the world of archives, documentation and textuality. First, he discovers textual evidence of Murugan — if one treats the ID card as text. He retrieves, at second hand, the archives that Murugan had uncovered regarding Ross, Farley, Grigson and Cunningham — all of whom leave behind textual evidence in the form of letters and other writings. Urmila and Sonali begin by listening to Phulboni, whose speech eventually returns to the story he wrote years ago about Laakhan. Urmila’s information network comes in the form of a strange connection with Romen Haldar and a soiled newspaper with an item from the distant past. Such textual connections, as Claire Chambers has proposed, are indicative of other networks, boundary-crossings and confusions as well (2009).

For instance, the borders of animals and humans seem to blur in the novel. *The Calcutta Chromosome* breaks down the animal-human barrier by showing a miscegenated body, as DNA crosses over from pigeons to humans, mosquitoes to humans and finally, humans to humans. The gene pool is as messy as a duck pond, with traces of many races, genetic material and somatic features. When Ross is tracking the malarial parasite, with the invisible aid of Mangala and her cohorts,

it seems to move across humans, birds and insects. It seems to have a curious connection with the syphilis pathogen. Though Ross has little interest in these border crossings between diseases, the entire colonial research is in fact steadily underwriting Mangala's teams research into syphilis as well. Textual, genetic and behavioural characteristics are all presented as border-crossing and species-blurring in what is a posthuman condition (where posthumanism, as defined by commentators like Cary Wolfe, is about mutually dependent species, species-crossings and humans co-existing with other species, where the line between animals and humans or humans and machines, is impossible to sustain because of the constitutive nature of these 'species' and forms of life).

The political body is surely that which is constructed by anti-colonial science. The syphilitic bodies that are cured by Mangala become the basis for a new race of humans. Mangala's project is political because she hopes to engineer this new race by controlling their traits — not unlike genetic engineering projects of late twentieth-century technoscience. These genetically modified bodies are political bodies because their evolution is masterminded in a human laboratory, and because their categorisation as 'human' is open given that their genetic code is a messy mix of various species.

Ross seeks to revolutionise tropical medicine (which was primarily about preventing the colonial masters from falling victims to local diseases) through the discovery of the parasite. The bodies he is given are political in the sense that Abdul Kadir and Laakhan are experimental bodies deliberately planted in his laboratory. The political body here is fused with the experimental and informational body — but it is one that symbolises (anti-colonial) agency. It is a body that alters the course of medical history, and subverts the colonial powers of domination. It is a body that does not get colonised within Western medicine alone.

In fact, elaborating what he means by the Calcutta chromosome, Murugan offers a critique of ways of knowledge-making (or, the contexts in which information is gathered and organised). Murugan says:

If there really is such a thing as the Calcutta chromosome only a person like Mangala, someone who's completely out of the loop, scientifically speaking, would be able to find it ... It's exactly the kind of entity that would be hardest for a conventional scientist to accept. Biologists are under so much pressure to bring their findings into line with politics: right-wing politicians sit on them to find genes for everything ... (247–48)

What Murugan is saying here is that despite, or because of, the very structures of knowledge from within which Ross and his compatriots operated, they could not even envisage an entity like the Calcutta chromosome. It is the 'untrained' Mangala who 'stumb[les] across the process of transmission' (248) because she 'didn't know what a chromosome was' (248). The malarial pathogen-body in the 'native' mosquito and the human carrier might be something the colonial scientist can imagine, but cannot find. It is the 'natives' who colonise the Western medical research by directing them toward the 'right' malarial problem (by implanting

bodies, blood specimens) but also, under this guise, seek to find the Calcutta chromosome.

Then there is the mythic body. Ross is on a quest for a malaria infected body. Cunningham has an out-of-this world experience in a séance. The mythic body is one whose human contours get blurred, fusing with myths, images, stories and histories. Part of such a body is 'drawn' or derived from textual evidence of the body: does Laakhan really exist or is he a mythic construction? Further, the bodies of Maria-Tara, Urmila-Sonali merge into each other, and all of them into Mangala. The SimVis and the cyberspace inside Ava become a space where distinctive human identities dissolve and new ones emerge — identities that existed only in myths (Mangala, Laakhan) or history. By the end of the novel there is a confused mass of bodies.

What I am identifying as cyborg bodies are those that exist in the interstices of the mythic, the technological, the textual and the political. There is no body that is unique in *The Calcutta Chromosome*. Everybody is something else too, at least in terms of its genetic code. These are bodies that do not fit a classificatory regime or scheme. Like cyborgs that occupy that space intersecting the human, the machine and the animal, *The Calcutta Chromosome's* 'body of information' is precisely that — a body with few identifying characteristics, a mass of information from various versions, texts, sources and memories. Every body in *The Calcutta Chromosome* is a collective body, carrying the traces of political battles, scientific cross-overs and myths. They are all cyborgs, bodies that do not fit the taxon.

When the novel ends Antar has merged the information codes from Murugan into his body. The transportation of 'souls', facilitated by the transmission of computer code, or the malarial pathogen — Murugan and Urmila have acquired the pathogen through sexual contact — is complete and a cyborg is born. It is now a body: (i) that does not fit the taxon for it is neither Antar nor Murugan alone; (ii) which is a congeries of code (computer, biological parasite, DNA); and (iii) that might be 'versions' of older forms of bodies (maybe Antar is now Antar 2.0). Ghosh reworks the question of identity itself here by proposing that information being transmitted could result in identities being transmitted and changed in the process of transmission. Antar becomes Murugan and perhaps even the mysterious Lakhan. Urmila, Tara, Sonali all begin to collapse into each other's identities. When Antar enters Ava's consciousness at the end, he joins and is joined by a host of other people:

'We're here.' There were voices whispering everywhere now, in his room, in his head, in his ears, it was as though a crowd of people was in the room with him. They were saying: 'We're with you; you are not alone; we'll help you across'. (306)

The singularity of the individual human — that epitome of Western Enlightenment — is no longer valid in this cyborgisation. Ghosh reinstates the Indian/Hindu theme of reincarnation and merges it with Western advanced science and bioinformatics. Anticipating the potential and challenges of the age

of information and the increased cyborgisation of bodies and individual identities, Ghosh appropriates myth, legend and scientific discourses (and discoveries) to offer us a congeries of the human, or what could more accurately be a posthuman. If this be a 'postcolonial new human', as Nelson calls it, it is one based entirely on information exchange and embodiment. Ghosh's is a posthumanist view because he shows Antar and the others evolving into something else altogether with the aid of various 'structures' and 'species'. Antar *embodies* connections, networks and linkages across life forms (animals and humans), ecological systems, environments (laboratories, the cities) by demonstrating how life forms evolve together, embedded within relational structures, all made possible through networked *information*. Pigeons, mosquitoes, the malarial pathogen, human bodies, the syphilis pathogen, electronic data *constitute* the Antar at the end of the novel. The transmission of the Calcutta chromosome across species borders blurs the autonomy of the human (Antar) — a characteristic of the posthuman.

#### NOTES

- <sup>1</sup> Ross, 1857–1932, a British doctor, discovered that malaria was transmitted through the bite of the anopheles mosquito, a discovery for which he won the Nobel in 1902.
- <sup>2</sup> See Khair, Chambers, Halpin, Thrall, Banerjee.
- <sup>3</sup> These projects have been studied extensively for their socio-cultural and political implications. See Wilkie (1993), Jackson (1999, 2001), Keller (1992, 2000), Waldby (1997), Nayar (2006).
- <sup>4</sup> Transcoding is the process of translating something into another format. For instance, cultural categories and concepts are 'substituted ... by new ones which derive from the computer's ontology, epistemology, pragmatics' (Manovich 64).
- <sup>5</sup> On cyberpunk as a literary genre see, among others, McHale (1991), McCaffery (1991) and Cavallaro (2000).
- <sup>6</sup> Christopher Shinn proposes that Ghosh's novel offers an 'evolutionary organicism' instead of a 'cyborg ontology' (146). My own argument regarding Ghosh's cyborg theme is based on an entirely different trajectory of investigation: that of the informational economy.

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