



The Half-Life of Empire in Outer Space

Author(s): Peter Redfield

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ABSTRACT This paper addresses an intersection between postcolonial studies and science studies, examining the greater colonial context of space exploration. In response to Chakrabarty's call to 'provincialize Europe', I ask what it might mean to 'provincialize' outer space, considering locality relative to extra-planetary distance, and the asymmetries of history next to the symmetrical methodology advocated by Latour. By way of a brief reading of fictional texts that played an important rôle in the technical imagination leading up to spaceflight, I sketch the colonizing impulse that underwrote space exploration through and beyond the age of empire. I then turn to the French/European launch site at Kourou, French Guiana, where a sparsely populated former colony became a preferred launching ground for communication satellites into equatorial orbits. Here the representation of outer space as a final frontier crosses the remains of older colonial projects, uneasily confronting the landscape of their human legacy. In opposition to the space centre's focus on adventure, political focus within French Guiana stresses development and strives to confront the space project with the local legacy of colonial failure. A conflict over the closing of a stretch of road provides a situated moment to illustrate these contrasting understandings of the place of outer space. In this conflict, I suggest, the very length and orientation of the space centre's network affect the locality of its representation, revealing after-effects of earlier formations of geography and history. Thus, in resituating outer space against the ground, it remains important to distinguish between local knowledges and techniques that are more or less expansive, and keep in sight the different spatial and temporal frames within which 'the local' takes shape.

Keywords Ariane, Chakrabarty, French Guiana, Latour, networks, space technology

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Peter Redfield

... the project of provincializing Europe must recognize within itself its own impossibility. [Chakrabarty (2000): 45]

Even a longer network remains local at all points. [Latour (1993): 117]

Amid the proliferation of writing concerned with spatial themes in social theory, I am frequently struck by the absence of attention to *outer* space, that is to say, the vast, extra-planetary habitat of satellites and science fiction. In one sense this absence is not surprising, given that current literature across a number of domains emphasizes the importance of locality in human affairs, particularly in opposition to the proliferation of global metaphors and transcendent claims made on behalf of capital and science.¹ Thus political metaphors such as 'grass-roots' carry with them a

moral valence, suggesting that justice and goodness lie close to the ground. Within science studies, the repeated claim that ‘all knowledge is local’ has come to function as a similar article of faith, attesting to the primacy of actual practices over ideas and implying the possibility of equality once one examines them.² While sharing the political and moral temptations involved, I none the less feel hesitation at the ease with which they can lead us to forget what we know, reducing scale too neatly to a general function of length and size, and implying commonality between units even when distinguishing between them. All knowledges, practices and objects may indeed be local, but are they *equally* local? Or are not some, as it were, more local than others?

In the following paper, I consider outer space from the perspective of empire. I seek to engage elements of two literatures, postcolonial studies and science studies, with intersecting zones of representation and material practice surrounding our planet. I begin with a quick recapitulation of Dipesh Chakrabarty’s analysis of postcolonial thought and historical difference, positioning his call to ‘provincialize Europe’ against the spatial imagination of science studies, as quixotically exemplified by Bruno Latour’s extension of a principle of symmetry. What, I ask, could it mean to provincialize outer space?

To establish the difficulty of such an enterprise, I first outline the manner in which outer space fuses the language of empire into an apparently singular, defining form. Amid explicitly imperial tropes of representation, space offered the prospect of a renewed form of settler colonization, this time into a zone safely free from human difference. After examining a few key moments of cultural production establishing fantasies about human spaceflight, I then turn to French Guiana, a particular place and local history now intimately engaged in the more mundane practice of satellite launches. At the French and European space centre at Kourou, colonial history feeds directly into the Space Age by literally providing the launching ground for the Ariane rocket. In opposition to the space centre’s rhetorical focus on adventure and its practice of state ambition coupled with international commerce, political focus within French Guiana returns repeatedly to a master theme of development, and a re-localized frame of colonial obligation and dependence. A conflict over the closing of a stretch of road running through the centre provides a situated moment to illustrate these contrasting understandings of the place of outer space. My goal in pairing these examples is to recombine elements of imaginative discourse with technical practice, tracing the trajectory of adventure as it leaves the planet, and highlighting the historical geography of power that runs through the Final Frontier. I hope to show that outer space constitutes not simply a productive limit to the possibility of provincialization, but also a productive tension within any project of localization: a simultaneous reminder of the permeable edge of human mobility on the one hand, and of the slow decay of human history on the other.

At stake in this example for science studies, I believe, is a recognition that any effort to deflate universal claims into local knowledge practices

must not lose sight of the different spatial and temporal frames within which 'the local' takes shape. Amid struggles over expansion and connection, the relative length and orientation of networks affect their representation, as do after-effects of prior alignments and vectors of motion. Scale is not an inherently neutral quality, but rather itself operates as a sign, one that lingers through time and 'limit forms' of space. I want to emphasize that it matters how long a network is, where it goes and how it goes there. For following empire, certain practices of extension are simultaneously acts of representation, connecting future and past. In resituating the seemingly universal aspects of technoscience within the ordinary actions of humans, then, it would be important to distinguish between local knowledges and techniques that are more or less expansive, and invested in different temporal orders.³

Provincializing Symmetry

In a recent volume that builds on an earlier, highly influential article, Dipesh Chakrabarty (2000) argues that a goal of postcolonial work must be to 'provincialize' Europe, that is to say, contain and interrogate the manner in which modernity is unthinkable without reference to that continent. Chakrabarty's 'Europe' is not so much a place as a discursive frame, a conceptual conduit through which all discussions of modern categories and institutions must pass, no matter their immediate geographic context. As such it serves as a 'silent referent in historical knowledge', the lodestar against which all others must orient themselves to derive their sense of location and direction. Chakrabarty [(2000): 28–29] notes that scholarship exhibits patterns of 'asymmetric ignorance', whereby a historian of India must forever refer to Europe without expecting reference in return. Europeans, and those writing about them, could claim universal theory as a birthright, without the slightest concern for the majority of human historical experience. Rather than responding with relativism, Chakrabarty's goal is to reveal modernity as inevitably contested, and hint at other possible formations of association beyond citizenship and the nation-state. As witnessed by his deep engagement with German philosophy, Chakrabarty [ibid.: 46, 255] regards the legacy of European thought as a gift, and his struggle to provincialize simultaneously evokes an 'anti-colonial spirit of gratitude'.

The project of provincializing Europe can stand in for the spatial desire of postcolonial studies, whose repeated tendencies are to decentre and diffuse the place of the West within accounts of modernity. To provincialize would be to render less than imperial, to deflate, to relocate within particularities, to expose contingencies and find local habits beneath court manners. In much postcolonial writing the target is that of cultural production, particularly literary texts and the traditions of scholarship that surround them. In Chakrabarty's case the subject is history, and the manner in which human relations are continually reworked around unequal narratives of time. He interrogates both Marx and Heidegger with

the context of Bengal, in an effort to dislodge modern subjects from the singular future promised by historicist reason. While this work does not focus on issues of science and technology, it implicates them, given that these are precisely the elements around which claims to progressive reason are built.⁴ In recognizing and destabilizing the asymmetries of history, one presumably must take account not only of inequities of capital flow and accumulation, but also of knowledge, expertise and material function. Machines in particular are significant temporal markers, implying breaks, and the reordering of future and past around new horizons of possibility. To provincialize Europe, the ‘Europeaness’ (or more generally the ‘Westernness’) of both science and technology would have to be located, grounded and reduced, such that the geography of the future would reveal less certain centres. To what extent is such a project possible?

As a quick point of comparison, I turn from postcolonial to science studies, and scholars who directly engage with artefacts of instrumental reason. I will focus on the work of Bruno Latour since, like Chakrabarty, he combines the influence of original insight with a provocative spatial metaphor, in this case the term ‘symmetry’. ‘Symmetry’ is a metaphor of alignment, rather than location, but when applied to a potentially transcendent phenomenon like science it displays an anchoring effect. Latour takes an earlier tradition within the sociology of scientific knowledge of balancing the terms of causal explanation across analysis (thereby resisting the simple resolution of truth into nature), and extends it into a methodological talisman [Latour (1993): esp. 94–96].⁵ Arguing that agents and objects should be considered with a common analytic vocabulary, he further suggests that a ‘symmetrical’ anthropology would reveal that ‘we have never been modern’ all along. Latour’s project of symmetry, along with related work in ‘actor-network theory’,⁶ and Donna Haraway’s (1988) more politically inflected ‘situated knowledges’ can stand in for the spatial desire of science studies, whose repeated tendencies are to oppose hagiography and neutral abstraction by emphasizing particular, grounded sites and relational moments of practice. In Latour’s case, he is especially concerned with the purification of heterogeneous networks into categories such as science and society, humans and nonhumans, as well as the inevitable recognition of hybrids between them. Thus recognition of scale occupies a crucial place in his thought, representing the key to the sort of nimble translation that reveals connection, and the possibility of reordering. The motion and multiplicity of networks disrupt categories, including those of presence and separation, or immanence and transcendence.⁷ A railroad may provide rapid and extended transport, but it remains a discrete and incomplete array of elements, never arriving at all possible destinations. As Latour so arrestingly puts it in the passage cited above: ‘even a longer network remains local at all points’.

Latour’s quest for symmetry and Chakrabarty’s for provincialization share a common oppositional stance to floating assumptions framing modernity. Both seek to limit the advantage of the favoured element within binary pairings, and recognize the importance of replication within power.

But they vary considerably in approach, emphasis and the particularities of spatial framing. Where Chakrabarty wishes to make asymmetries visible within shared categories and posits equality as an anti-colonial ideal, Latour wishes to make symmetries visible within separated categories, and posits a form of equality as a methodological principle. For Chakrabarty, tides of history and alignments of geography matter, for they are precisely the source of continuing imbalance. For Latour, strict attention to history and geography masks the inherent mobility of the mutually constituting and struggling actors, interests and objects composing them. Thus while Chakrabarty – like many practitioners of postcolonial studies – carefully repositions fluid, but ultimately locatable units like ‘Bengal’, Latour – like many practitioners of science studies – moves almost carelessly through them, following specific, but ultimately interchangeable (and often nonhuman) elements like a microbe or a door closer.⁸ Distinguishing Chakrabarty’s and Latour’s patterns of thought is a concern for the enduring legacy of empire, and the imbalances of human history. To take both authors seriously poses a riddle: we may never have been modern, or at least not in some of the ways we like to think. But some of us have certainly been more colonized than others, marked by race, language and other artefacts of historical difference. What are we to make of these combined insights?

The intersection between postcolonial studies and science studies presents a range of possible projects.⁹ One might highlight multiple lineages for specific ideas, research traditions or objects, pointing out the non-Western lineage of rockets, for example. One might examine subordinated knowledges, hybrid practices or reconfigured machines, looking at alternative trajectories towards future, low-tech applications of satellite links, for example. Both such approaches could complicate the map of modernity within science studies, suggesting that ‘the modern’ not only is not a singular or certain conceptual condition, but also that it is geographically unstable as well. At the same time, they might also echo back in the other direction to postcolonial studies, reintroducing a more chaotic sense of categorization and materiality to those preoccupied with historical difference and the interpretation of texts.

In this paper, I take a related but slightly different tack, emphasizing degrees of distance *within* locality, and examining intersections of place, power and time implicit in the location and operation of a vast technical network. For if we incorporate colonial history into our considerations of science and technology, do we not always, continually, need to ask what it might mean for something to be somewhere relative to somewhere else? My focus will rest directly on the spatial edge between metaphor and materiality used to distinguish global and local: the planet, united and bounded by its atmospheric limit, revealed and transcended by technoscience. The general argument I will advance here is that outer space reflects a practical shadow of empire.¹⁰ I mean by this two things. The first is that space represents a kind of stabilization of ‘elsewhere’, and its removal from the globe. From the very inception of influential modern

dreams of space exploration, the masculine adventure of earthly colonialism was a constant referent, and the temporal pairing of rocket launches and the greatest anti-colonial movements only accentuated the parallel.¹¹ Indeed, the realization of outer space – its initial domestication if you will – represents the effective provincialization of terrestrial empire *from above*. Once a few white men moved beyond the atmosphere they became newly, artificially human by virtue of the nonhuman space around them, cast as universal representatives by virtue of their transcendent, hazardous location. Once extended beyond the planet, modernity acquired the possibility of another geographic frame, intermingled with a new temporal order. Whatever the past may have been, the future was clearly *out there*, and everything else a local concern. Aliens became extraterrestrials.

The second way in which I want to link outer space and empire is the manner in which each enacts and represents place in terms of connection, dislocation and the possibility of an ever-longer network. Just as an imperial outpost signified not only itself but also the expansion of a metropolitan centre, so too a satellite link is both an immediate presence and a conduit beyond the horizon. In a sense, outer space puts human place into three dimensions. This is simultaneously a highly practical matter, involving a material assemblage of launch vehicles and a swarming of satellites, and a representational one. For looking up from the ground implies a motion away from it. In a setting marked by colonial history such a motion is not neutral, as I hope to illustrate in French Guiana. First, however, I will review some of the more obvious traces of empire in dreams of space travel.

The Inertia of Adventure and Another New World

When discussing the conquest of space, it is automatic to refer to Christopher Columbus. [Pecker (1987): 3]

The rhetorical link between outer space and colonial history requires little introduction. Anyone with a passing acquaintance of the Space Age is familiar with its frontier metaphors and allusions to European colonial expansion, from the frequent appearance of male explorers past in NASA presentations to the imaginary exploits of increasingly varied *Star Trek* crews. The above quotation thus constitutes a reflexive, though casual, reference; its intended import lies less in the actual words transcribed than the reminder of a larger pattern echoing through them.¹² Just like colonial history itself, the field of representation running through outer space is complex, multiple and full of tension, encompassing the possibility of reversals and counter-themes, such as the reverse colonialism of alien abductions.¹³ However, at the base of rockets we can identify a consistent and optimistic reading of history through the future. In the aftermath of

the 20th century, advocates of space exploration constitute perhaps the last unabashed enthusiasts of imperialism, cheerfully describing conquest, settlement and expansion, and hesitating not a whit before employing the term 'colony'. Theirs is a Columbus of exploration, nation building and risk taking, not of invasion, domination and genocide. History is cleansed above the planet; unlike a group of Native American scholars meeting in the immediate aftermath of the Apollo landing, it would never occur to participants of workshops such as the one cited above to 'pity the Indians and the buffalo of Outer Space' [Young (1987): 271].

Here I will take the explicit tie of human activity in outer space to the vocabulary of earlier periods of colonial expansion and imperial rule – its blatant historical resonance – as seriously as possible, in order briefly to examine the ancestry and legacy of exploration, on and over the globe. To do so I first refer to two fictions of import to space history, Jules Verne's mid-19th-century sardonic fantasy of a moon voyage, and Fritz Lang's early-20th-century film epic on the same topic, both of which employ imperial tropes prominently in their narration. Between the two we can recall variant definitions of the key term 'adventure', and its implied personal or financial risk, part way between exploration and exploitation. I want to position 'adventure' to describe a form of extending networks, an ambiguous and plural category of movement, but one that is hardly neutral.

The history of rocketry describes an undeniably fertile intersection between fantasy and fact, a veritable garden of grafts between narrative, engineering and the legacy of adventure. No one embodies this observation better than Jules Verne, the one-time stockbroker who, in the relative bourgeois comfort of the French seaport of Nantes, penned tale after tale of breathless, male adventure in the far reaches of geography and machinery.¹⁴ Verne was not only a remarkably productive author himself, but also proved seminal in the second sense of encouraging productivity on the part of others. Among the most interesting of his devoted readers were not only future writers of what would come to be called science fiction, but also the pioneering figures of spaceflight: Tsiolkovsky, Oberth, Goddard, Korolev and Von Braun [McDougall (1985): 20; McCurdy (1997): 12–16]. Verne's 1865 work, *From the Earth to the Moon* [*De la terre à la lune*], in particular, is frequently lauded for its foreshadowing of events a century later.¹⁵

For our purposes, I would like to dwell on a passage found in the 1870 completion of the moon adventure, *A Trip Around It* [*Autour de la lune*]. Here our three protagonists, Impey Barbicane, the gun club president and instigator of the lunar shot, Captain Nicholl, his old rival and vigorous sceptic, and Michel Ardan, the impulsive Frenchman who inspired them to climb aboard, are hurtling through space *en route* to the moon. Under the influence of a surfeit of oxygen, they engage in a giddy discussion of their voyage and significance, and Barbicane admits he has not considered what they might do on the moon should they get there. Nicholl then demands to know why they are going in the first place:

‘Why?’ exclaimed Michel, jumping a yard high, ‘why? To take possession of the moon in the name of the United States; to add a fortieth state to the Union; to colonize the lunar regions; to cultivate them, to people them, to transport hither all prodigies of art, of science, and industry; to civilize the Selenites, unless they are more civilized than we are; and to constitute them a republic, if they are not already one!’

‘And if there are no Selenites?’ retorted Nicholl, who, under the influence of this unaccountable intoxication, was very contradictory. . . . The two adversaries were going to fall upon each other, and the incoherent discussion threatened to merge into a fight, when Barbicane intervened with one bound.

‘Stop, miserable men’, said he, separating his two companions; ‘if there are no Selenites, we will do without them’.

‘Yes’, exclaimed Michel, who was not particular; ‘yes, we will do without them. We have only to make Selenites. Down with the Selenites!’

‘The empire of the moon belongs to us’, said Nicholl . . . [Verne (1958 [1865/1870]): 140–42]¹⁶

This passage is notable both for its farcical tone and for the central importance of the topic under discussion: the very goal of the voyage. Only at this advanced point in the narrative – long after the characters can claim any semblance of control over their circumstances – does Verne raise the issue of why they have embarked in the first place, or what they might hope to accomplish. The characters quickly resort to a vocabulary of colonial adventure. Theirs will be a civilizing mission, but one in which natives prove ultimately dispensable. Should their destination prove a lifeless orb, then they will simply proclaim what they otherwise would have to enforce: a recognizable social order modelled on their point of departure. I suggest that this passage neatly encapsulates the assumed political geography of most later descriptions of humanity’s future beyond Earth’s atmosphere (the fact that it was written before the final push of European rule through Africa and Asia should give us additional pause, since it foreshadows high imperialism as well). In stories, at least, adventure can serve as its own justification, and achieve a momentum that renders its exact goal an afterthought. Extending a network can itself be an end.¹⁷

But what of more calculating interests, and less farcical possibilities of political economy? As a materialist counterweight, let us add another early cultural artefact of the Space Age, Fritz Lang’s 1929 film, *Woman on the Moon* [*Frau im Mond*]. Lang’s work is particularly significant because, as with Verne, the project sought a certain realism amid its romance (employing the rocket virtuoso Hermann Oberth as a technical advisor), and inspired the young Germans who would later make up the V-2 team [McCurdy (1997): 15]. In contrast to Verne’s novel, a material motivation for this flight is clear from the very start of the story, and it is Columbus’ very dream – the acquisition of gold. At the heart of this modern quest lurks a traditional sin of greed. Against the mad genius of Professor

Manfeldt (who first declares the abundance of gold on the moon) and the idealism of Wolf Helius (the romantic hero who dreams of space travel), stands the villainous Herr Turner, agent of the financiers who fund the rocket and care only about returning profit to earth.¹⁸ In addition to moving elements of family drama into space, Lang's film also features the establishment of a colonial environment, featuring displaced, closed social relations and an expanded ecosystem bent on export, such that the moon can acquire calculable value. Here the pure dream of space travel becomes tied to a less genteel promise of material gain. And yet a version of that dream not only remains, but also shapes the possibility of heroism.

I want to underscore three observations about these two famous moments of space fantasy. The first is simply an affirmation of deep rhetorical connections between exploration above and below the atmosphere. Despite the particularities of the cultural imagination displayed in them, when taken together these two works remind us of the greater narrative inertia inside the drive for adventure. While focus shifts to a wondrous horizon, and new, exacting techniques of exploration such as rockets and astronomical navigation, the field of vision retains earthly assumptions, desires and fears. As interesting as what each set of explorers seeks in the moon is what they bring with them: frock coats and a sense of civilization on the one hand, and campfire sweaters and a lust for profit on the other. The material is there for an effort to 'provincialize' these fictions by revealing the specificity of their historical debts. Such a project would remain a scholastic exercise, however, and well within the bounds of the literary end of postcolonial studies, were it not for the uncomfortable fact that these fictions provided space exploration with a recognizable future, and thus helped engender fantastic practices. These dreams found engineers, eager to materialize them.

My second observation is about the form of colonization being imagined: like the occupants of Verne's projectile for whom the 'Selenites' are ultimately superfluous, or Lang's heroic protagonist who stays behind on the moon, the history of space representation is full of visions of *settler* colonization. This point is not surprising, given the narrative topology of any act of leaving the earth or extending human life through the galaxy, but it has effects when placed next to the fissures of terrestrial history. Even the planners of the German V-2 dreamed beyond their engines of destruction, imagining an era of peaceful exploration, while American and Soviet cold warriors alternated geopolitical fears of final conflict with calls to embrace a new dawn for humanity.¹⁹ Amid explicitly imperial tropes of representation, space offered the prospect of a renewed form of settlement, this time into a zone safely free from human difference. Returning to etymological roots, humans could find new domains to culture, together, as a species.²⁰ By considering the earth as a planetary entity, then, fantasies of space exploration have presented a 'limit case' of one measure of scale. Within them – and their potential realization – the atmosphere serves as the threshold of human unity.

My final observation involves a potential dynamic of representation created by the interaction of the first two points. Like Verne's protagonists, committed to their trajectory and inventing a goal on the fly, the language of space exploration returns to history *post hoc*, within a planetary frame implying common humanity. Thus it should come as no surprise that the sense of history commonly invoked in space narratives is a species narrative, full of giant leaps. Here we have a variation of Chakrabarty's dilemma, only posed in scalar, rather than chronological terms. Just as European history naturally defines the categories of modernity by virtue of precedence, outer space naturally defines the globe by virtue of bounding it. Those people claiming this new realm seem to leave old ones – at least their more unpleasant details – behind. Such a space fantasy involves 'scale', both in the sense of a motion of expansion and the sense of establishing a boundary. It is consequently impatient with concerns that remain local (the actual lives of any Selenites), or ultimately earthly (the calculations of Lang's financiers). Space is a higher calling. In order to interrogate the continued resonance of this higher calling on the ground, moving from general discourse more deeply into specific practice, I will shift closer to the material present and briefly sketch a tropical outpost of high technology.

A Tropical Rocket

For the last two decades, about half the world's commercial satellites have been launched from French Guiana (*La Guyane française*), a sparsely populated French quadrant of the greater Amazon. In contrast to the colonial legacy of the territory – backwater plantations, a penal colony, small-scale gold production – a record one commentator acidly summarized as 'three centuries of error' [Hammel (1979): 21] – the Ariane rocket stands out as a technological triumph of international significance, a happy union between equatorial geography and satellite orbits. Yet the space centre's relations with the rest of French Guiana have remained fraught with tension, and the project is less clearly successful in terms of fostering local development than in placing satellites in orbit. Despite its relatively high standard of living, French Guiana remains economically hollow, devoid of significant production and dependent on French subsidies, while facing increased immigration and rising unemployment.²¹

The location of the launch site in French Guiana itself was initially driven by political considerations more than commercial ones. A return to 1964, the year the *Centre Spatial Guyanais* (or Guiana Space Centre, known by its French acronym, CSG) was established, will help to clarify the conjuncture between space technology and colonial geography. At that point French Guiana, one of France's oldest colonies, was already integrated into the French political structure as an 'overseas department', an assimilation meant to transmute the lead of empire into the gold of national entitlement. While its population was both tiny and heterogeneous (the bulk of the 40,000-odd then residents were descendants of former

slaves known as Creoles, but the total mix included Amerindians, Maroons, Europeans, Chinese and the remnants of various colonial experiments to encourage immigration), it also comprised an official subset of the French citizenry. From the perspective of Paris, this was a thoroughly French frontier, one that de Gaulle hoped would serve as a 'showcase' for the region. And having just lost a rocket base in Algeria, the French state needed another ground from which to claim a role in the Space Age [Mam-Lam-Fouck (1992)].

Space technology offered a way to make this open land newly functional in geopolitical terms. As rocket launches are potentially explosive affairs, low population densities and clear horizons comprise valuable features of any potential launch sites. The repeated failure of centuries of French efforts to increase the population translated into an opportune emptiness. Further geographical characteristics of the territory, especially its north-eastern coastline and proximity to the equator, also served as technical enticements, as launches in the direction of the earth's rotation save fuel and launches near the middle of the planet save the most of all.²² Thus, from the perspective of France's nascent space programme, a potential base at Kourou, French Guiana, presented an elegant solution to the needs of future rockets.

With the advent of the Ariane programme in 1979, designed and funded under the mantle of the European co-operation, and marketed by a semi-private corporation, CSG grew to realize its technical potential. Its rôle also became increasingly defined by overtly economic as well as political interests. Over the last two decades of the 20th century, it became a significant presence in the emerging market for commercial satellite launches, especially of communications satellites placed in geostationary orbit, high above the equator.²³ Intermittent setbacks aside, the Ariane series has performed as well as could be expected, and occupies a place of pride in French and European representations of technical achievement. In some sense, the rocket has clearly 'worked' and, from the perspective of Paris, worked very well. Europe has a presence in space, with France at its head. As a functioning example of high technology, Ariane is both an asset and a symbol. We might expect rocketry to stabilize as a transportation industry, infused with higher risk and status than trucking perhaps (a comparison jokingly suggested by one engineer), but similarly routine. And yet technology signifies more than its direct function. Relatively few states have the capacity routinely to achieve orbit using their own proprietary equipment, and thus Ariane plays a rôle in positioning France and a united Europe as entities associated with technological competence. Technological competence, as Michael Adas (1989) illustrated some years ago, is an old and central representational project of modern empire.

Even more interestingly, the rhetoric of spaceflight appears frequently in the Ariane operation, despite the fact that it has little to do with the centre's current mission. We find it in the brochures of the French and European space agencies ('Our inheritance – our future: space'), in the public museum at CSG, extolling the wider history of rocketry, even in the

celebrations of centre personnel, commemorating real and fictive achievements above the atmosphere.²⁴ A dream of adventure lingers on, even after the routinization of space as an enterprise. While plans for a European space shuttle named for the Greek god Hermes were shelved a decade ago, the agents of European space retain a commitment to a future beyond the planet, and CSG bears the designation of 'Europe's Spaceport'.²⁵

From the perspective of the local population, however, the space centre was a mixed blessing to begin with, offering the allure of intensive modernization, from improved roads to refrigerators, balanced against its costs, especially accelerated forms of social change.²⁶ The passage of three decades has only confirmed the misgivings of early opponents of the base, who feared that it would remain detached from the surrounding region. The initial, guarded official prognosis for its direct economic benefits has proven accurately modest, for while a number of jobs have certainly been created, relatively few locals occupy technical positions, and the programme has not managed to inspire local education in technical subjects [Mam-Lam-Fouck (1992): 296-97].²⁷ At the same time, a number of unexpected developments associated with the space centre, especially a remarkable upsurge in illegal immigration from Brazil, Haiti and Suriname, have transformed the old crisis of underpopulation into a crisis of surplus population, amid a social landscape awash with commodities and services. On a local scale, the rocket has not 'worked' in any simple sense, contributing to as many problems as it has solved. Yet it actively redefines significance within a European and global frame, enlarging the field of connections surrounding local life. Space both is and isn't an abstraction: such is the wonder of satellite technology; such is the dilemma of the contemporary globe.

Development and the Lack of Wonder

I consider the money that CSE [CSG] pours into Guyana as a due, and it is insufficient with regard to the fallout and suffering undergone. . . . Today it's the road, tomorrow it will be the airport, next the port and then perhaps Kourou . . . When I visit Kourou I have the impression of being in a town of South Africa under apartheid, and I am not alone; I feel sick. [Reader of Radical Paper, Cayenne, 1994]²⁸

In order more accurately to sketch the contrast of perspectives involved, I will introduce a further element of locality: a specific struggle over a stretch of road running through the space centre that occurred in 1994. This minor political moment was part of a series of interrelated episodes taking place that year, including the airing of tensions over the impending opening of a large dam built to provide French Guiana with hydroelectric power to meet its expanding appetite for energy, and protests and counter-protests over the possible completion of another stretch of road to Brazil.²⁹ Of these three conflicts (and amid the greater pattern of intermittent social unrest in French Guiana), the space road most directly confronted CSG with its local setting, and the potential relation of that setting to its mission.

What I would like to do here is quickly to outline the dispute, and provide sufficient analysis to underscore its spatial significance. The language involved will also illustrate how official representation positions the space endeavour as a wonderful national and supranational adventure, an inheritance in the lineage of Verne or Lang as much as the colder calculations of international finance. Against this official representation, an array of Guianais actors position the space centre as the embodiment of distanced state activity, removed from its immediate surroundings and focused above the heads of ordinary citizens, particularly those of non-European extraction. They emphasize the space programme's Europeanness and connection to the colonial past, calling for economic development and local control, instead of space adventure.

Amid the actions and rhetorical claims of different groups of actors, I will suggest, we find rival spatial-temporal frames. Though all recognize the road to be a form of public property, the 'public' involved varies widely, from potential voters and constituents of French Guiana, to agencies of France and Europe, and on to future human generations. Though all recognize the road to be a legacy of the past, the 'past' involved likewise varies widely, from long-failed slave plantations and a consistently neglected colony, to an earlier phase of a successful enterprise and state investment, one now superseded by modified security considerations. Behind these spatial-temporal frames lie the asymmetries surrounding modernity and Europe invoked by Chakrabarty. For space officials, their own modernity is never in question, providing they kept pace with rival rocket consortia and the national entities involved in them. For at least some of those protesting the road closure, their own modernity is potentially in question, and directly at stake in the road. For the elected officials of French Guiana, appropriately positioned in a mediating position, the *calculation* of modernity is strategically in question, understood to be 'development', as measured in European terms and supported by state appropriations.

To understand the conflict one also needs to grasp two things. The first is that French Guiana holds a different 'postcolonial' status from that of most former colonies, in that it was assimilated as an overseas department of France following World War II. Hence, in political terms, it is officially *part* of France and Europe, its distance from Paris and its tropical landscape notwithstanding. The second is that French Guiana has essentially only one paved road, extending from the border with Suriname to the northwest, and part way to the Brazilian border to the southeast. The construction of the original stretch of this road constituted one of the central, failed work projects of the penal colony in the early 20th century, when it crept along so slowly as to merit the informal moniker 'Route Zero' (as opposed to its official designation as 'Colonial Route Number One').³⁰ Infrastructural improvements associated with the initial phase of the space programme in the 1960s replaced ferries with bridges, greatly reducing travel time between the coastal towns. While this road now has several

offshoots and differently named loops and extensions, it remains incomplete, with travel to the Brazilian border a matter of planes or boats, and that to interior settlements a matter of planes and river canoes. Despite limited pavement, however, by the 1990s, French Guiana maintained both a high level of car ownership, and an impressive rate of traffic accidents.³¹

A segment of this major coastal road crosses directly through the designated territory of the space centre, passing between major technical installations. During the fledgling days of the space enterprise, this was a desirable state of affairs, since the launch site needed a connection to longer networks of supply. Indeed, potential access to transportation was one of the concerns in selecting the location of the base.³² By the late 1980s, however, the commercial success of the Ariane programme and the dramatic increase in the size and mobility of the surrounding population altered CSG's perspective on the road. Industrial espionage and terrorism had emerged as spectres to haunt the plans of the space centre, along with a general wariness of local disruption, from strikes to slow-moving traffic. Launches came far more regularly than they had in the experimental days – once every month or two – and, with a backlog of flight orders, the sequence between them left less room for delay. Moreover, the development of the next generation Ariane-5 rocket and the fuel supply associated with it heightened fears of potential explosion. Even though uninvited vehicles were by now forbidden from stopping while *en route* through the centre, space officials continued to work towards further limiting access to their domain. Towards this end, they sponsored the construction of a deviation road swinging in a large loop around the space centre. The opening of this alternative route in 1991 facilitated closing the old one during launches, as traffic could now be diverted throughout the critical day without major inconvenience. It also allowed CSG to begin to press for complete closure of the old road, which they wished to designate the 'Route de l'Espace', or 'Space Road'.³³

The car-driving public, however, displayed little enthusiasm for the new, longer deviation, but rather continued to use the old road whenever possible. Despite the construction of an interchange design encouraging the use of the deviation, a steady stream of cars headed straight through the space centre on every day it was open. In the early summer of 1994, space officials manoeuvred quietly for total closure, urging the state to decommission the road and transfer jurisdiction to them. A group of prominent local elected officials (referred to colloquially by the French term '*les élus*', and largely tied to the dominant Socialist Party), staged a pre-emptive strike by holding a press conference in early July. Collectively they warned of increasing estrangement between French Guiana and the space programme, accusing the space centre of operating as a 'state within a state'. Even a more politically conservative politician among them cautioned that continued strife might lead to a 'divorce'.³⁴ Reaction was swift. The representative of Parisian authority called a meeting between space officials and the local representatives and oversaw negotiations. On 13 July – the eve of the French national holiday – he announced that while

the road would indeed close, a new initiative would seek to foster the development of French Guiana alongside that of the space programme.³⁵

Up to this point, the dispute would seem to illustrate a more general pattern of conflict between large technical installations and the social orders immediately surrounding them. For the officials of CSG, the road represented a necessary, if not particularly glamorous, element of the larger Ariane system. Its closure was understood as a technical issue, an effort to control a few of the vast array of variables that went into every launch, each threatening potential failure. For the local politicians, the road stood both for a limit on their own authority and a larger pattern of relations between CSG and French Guiana. Its closure was understood as a political issue, a question of territorial use and the allocation of authority. Mediation by the prefecture produced a solution familiar in both international and local terms: enhanced compensation. CSG could incorporate the road fully into its technical system, but would have to contribute more to a new initiative addressing local concerns. One could easily imagine something similar taking place in Metropolitan France.

Yet the matter was not yet over. A less established political organization known as MDES (*Mouvement de décolonisation et d'émancipation sociale* [Movement for Decolonization and Social Emancipation]) took up the ball, accusing the space centre and the French state of colonial practices, and the elected officials of betrayal.³⁶ They demanded that the matter be put to a referendum, and set about gathering signatures of support. A night rally held in Cayenne drew a crowd of several hundred, as speakers shouted slogans in both Creole and French, decrying the loss of culture and tradition as well as the road. While activists encouraged passing drivers to sign their petition (they would eventually claim 10,000 signatures, a remarkable figure given the region's small population), a series of impromptu speakers addressed the crowd. One woman pointed out that for all the advanced satellites riding up into the sky from Kourou, towns in the interior of Guyane lacked reliable television and phone service. 'What use is the space centre to us?', she asked, generating applause. Another man reminded the audience that the road had existed prior to CSG's arrival, and suggested that it would also exist after the centre's departure. 'What do we get?', he asked rhetorically, 'Colour TV, but they still think we're savages'.³⁷

The seizure of the issue by MDES not only added life to the dispute, but also amplified the language involved. Leading members of the group had old ties to the abortive independence movement of the 1970s. While, by the 1990s, the calls from MDES and similar groups were less for any immediate independence than for political autonomy coupled with greater economic subvention, they nevertheless embraced the legacy of anti-colonialism. During this dispute, MDES played several political cards at once. In the petition drive, the group presented itself not only as the voice of working class Creoles and (some) immigrants – its desired political base – but also as the voice of locality, inviting Métros (the local term for

Europeans in French Guiana) and Chinese (locally categorized as shopkeepers, and often classified alongside Europeans) to enrol in their protest as well.³⁸ All they wanted in this case, they insisted, was to assert a principle of *local* control, and put the matter to a public vote. At the same time, their remarks in an open letter to the elected representatives were scathing and cast in bluntly racial terms: 'You deceive your people', they charged, '... France only develops in French Guiana that which interests it, notably the base of Kourou ...'. The letter goes on to enumerate forms of racial discrimination felt by youth in particular, referring to the space town of Kourou as 'Kourou the white', and CSG as CSE ('Centre Spatial Européen'). 'The definitive closure of the road', MDES concluded, 'is thus a continuation of the colonial despotism of France; you are making yourselves its accomplices'.³⁹ While the Socialist party issued an equally scathing response, accusing MDES of political posturing and 'demagoguery', the latter were quickly joined by Walwari, another new radical movement that had just succeeded in electing its marquee candidate to the European parliament. In their statement, Walwari noted that '... it clearly appears there are two kinds of elected officials: those who make themselves accomplices of colonial power, and those who defend their people in the face of the extortion of technocrats'.⁴⁰

Here we have elements of another common story: manœuvres by political groups seeking advantage and rhetorical positioning in order to extend their influence. Again, one could imagine parallels in Metropolitan France. However, the stress on 'colonialism' as a key term with historical and racial resonance adds another element of positioning amid the emphasis on locality as a political virtue. The particular mission of the space centre proves largely incidental for MDES, overshadowed by its identification with continued European control over French Guiana. Within the moral framework of an anti-colonial struggle, *no* technical rationale could outweigh asymmetries of rule. All it took to reposition CSG (in local rhetorical terms at least) was to change the last letter of its acronym. The space enterprise was then exposed as an alien operation, one still connected beyond the atmosphere, but no longer related to this particular patch of ground.

Alarmed by the prospect of sufficient outcry to disrupt its operations (as previous strikes and protests had done), the space centre went on a counter-offensive. Local television crews were given elaborate tours, and shown the large stocks of hazardous materials.⁴¹ Space officials granted numerous press interviews, citing concerns for public safety, and categorically denying any desire on their part to segregate themselves from the rest of French Guiana. Rumours of plans for a separate port and airport were unfounded, or were misunderstandings of plans for the suspended Hermes spaceplane project.⁴² Furthermore, the design of the deviation was the best possible, they claimed, given constraints of safety and the need to meet the access road to the area's new dam. As a gesture of concern, they even offered to cede land south of the deviation road back to general state control. With all these actions, they reiterated that their interest in the

space road was purely *technical* in nature; they had no ambitions for terrestrial territory beyond what was necessary for their launches.⁴³

In October – several months late – the space road finally closed without inciting riots. The promises of additional development aid were added to previous plans. MDES enjoyed enhanced status as a political force. The French national space agency (in keeping with general state practice) ignored the local context and launched a public relations campaign focusing on French astronauts in an effort to generate good will. Life went on without any of these outcomes having much demonstrable effect, other than the road closure. However, the acrimony beneath the dispute was not quick to dissipate, reverberating against past conflicts, and hinting of more to come. The ‘Route de l’Espace’ overlay ‘Route Zero’, but could not entirely cover it. While the situation may have stabilized in terms of outcome, the same modest strip of pavement continued to fit into very different historical narratives. For one of these narratives, the road’s connections to prior projects were incidental; for the other, essential.

In this small struggle over a road, we glimpse a larger array of elements in play. Traffic flow involves humans, machines and contours of space, threading in and out of categories of nature and culture. Planetary geometry affecting satellites, a topography shaped by settlement patterns past and present, patterns of circulation combining gasoline and air-conditioning, different claims and understandings of sovereignty, all find their way into this particular, minor stretch of asphalt. For a brief moment, it becomes the political focus of French Guiana, a matter of some concern in a few offices in Paris, and a question mark on the production schedule of a few client satellites. A symmetrical analysis of the sort championed by Bruno Latour could insightfully dance between elements, following the attempts of different parties, human and nonhuman, individuals and non-individuals, to translate the alignment to their advantage. Outer space, or at least a segment of the far-flung, shifting networks that compose it, grows momentarily local. This locality is differently understood from different directions, to be sure. For space officials it is an obstacle, for elected officials an article of negotiation, and for the constituents of MDES a focus for political mobilization. For all, however, it remains a passage point, a problem in which they are all invested, along with the rocket and its satellite load.

Whatever the space centre might do, however, it could not *hide the length of its network*. Length and alignment of connections are precisely what are called into question by the use of a term like ‘colonialism’ by an organization like MDES. Beyond disagreeing over whether the road was a technical or political object, best understood in terms of the potential hazards of combustion or in terms of continued domination of French and other European interests, CSG and MDES disagreed on what ‘distance’ and ‘movement’ *themselves* signified. Categories of ‘nature’ and ‘society’ are not the only significant divide here; rather, we have divisions between human groups based on their prior position and relationships. The space

centre and its opponents stood on different sides of the history of exploration, deploying different spatial-temporal frames. To illustrate this difference, let us look more closely at the efforts of the space centre and of elected officials to resolve the situation.

A poster (Figure 1) used by the space centre in its public relations campaign later that year displays the heads of three French astronauts (including the first woman) next to the phrase '*l'espace – les enjeux du futur!*' (space – the stakes of the future!). On the left side of the image, a number of small figures in spacesuits build a gigantic golden head against the stars. In the lower right, breaking the curve of the planet, a small rocket base juts out from a welter of green jungle. Tellingly, there are no human figures amid the forest, though one of the spacesuits finds reflection in the gleaming cheek of the emerging giant. This new being transcends both blood and territory, requiring neither a mother nor an attachment to the ground.⁴⁴ The local world of the space centre assumes translocal dreams, a desire for mobility with long colonial heritage. The poster is a call to wonder, to an adventure not that removed from that of Verne's fantasy, though devoid of the latter's irony and humour. The future is at stake, to be sure, but terms of the wager are already known.

This poster is remarkable in a number of ways, perhaps most of all in how little it relates to the current operations of CSG. No astronaut has been launched from Kourou, nor is one about to be, despite the long-standing dreams of both the French and European Space Agencies. Human routes into space still pass through Florida and Kazakhstan. The everyday, practical business of the Guiana Space Centre is the launch of commercial and research satellites, not the construction of new beings beyond the atmosphere. And yet, precisely at a moment of tension, the centre officially resorts to this fantasy of exploration, one that recasts its rather earthly business as a noble adventure. Rather than playing the rôle of the nefarious financiers in Lang's old film, the CSG poster identifies with his hero Heliuss, reaching for the stars. The image is a very general one, potentially connected in a vague way to all moments of prior earthly exploration and adventure. These representatives of France act in the name of anyone who might look up from earth.

At the same time, both French Guiana, and its particular history are clearly incidental within the poster's vision. The focus rests on outer space and the future, not the launchpad and the past. Unsurprisingly, neither this particular poster nor the event it advertised appears to have made much impact beyond the space centre's immediate circles.⁴⁵ The image of smiling Europeans dedicated to joining the human conquest of outer space offered little to assuage the sensitivities of those Guyanais who signed MDES's road petition, or involve them in the imagined community of would-be astronauts, awaiting the day when European rockets might lift unprofitable humans rather than profitable machines. As witnessed in the road dispute itself, the Ariane programme is the focus of suspicion far more than wonder in Guyanais politics.

FIGURE 1
The CSG Poster



Source: CNES/CSG. Reproduced with permission.

The language of 'development', on the other hand, resonates continually throughout French Guiana, in large and small ways between the rocket and its surrounding sea of trees. The compromise accepted by the politicians who first objected to the road closure revolved around this term, and CSG's financial participation in another new initiative for the region. At the centre of such development discourse lies an insistence on recognition and redistribution of growth, within the framework of asymmetrical world and regional economies. The future here is one of intensification more than expansion, an accretion in place rather than a departure from it. Elements of this vision of development are particular to this peculiar political context: French Guiana remains attached to France as an assimilated former colony, one that combines a relatively plural, low-density population with a relatively high standard of living, and features far more in the way of forest than farms. But the overall frame translates widely, amid an assemblage of interrelated programmes, measurements, dreams and material transfers circulating on an explicitly international scale. Emerging from colonial roots, this assemblage coalesced following World War II around the 'making and unmaking of the Third World' [Escobar (1995)].⁴⁶

MDES partly framed its dismissal of the elected officials' compromise plan in terms of the anticipated shortcomings of its development effects, suggesting that in the end the results would serve the interests of France more than those of French Guiana. The open letter also decries the closure of the road in terms of eliminating the potential for farming and building on the land around it, recalling the earlier expropriation of small plots in the establishment of the space centre.⁴⁷ But even this clever rhetorical link between past and present does not dislodge the *possibility* of development, or the changing nature of the road itself amid an expanding population of people, cars and commodities. Rather, it reinforces a local claim through an allusion to longer networks of history, using them to define the current sense of injustice. Any longer networks of the present must acknowledge these prior alignments, for here the definition of the local *includes* them.

In an ethnographic examination of agricultural practices in a village in India, Akhil Gupta [(1998): 232] suggests a key aspect of understanding the political condition of the population in question is their status as '*failed* subjects of modernity, a position whose burden they feel acutely'. The very framing of development projects contains a modernist sensibility, one in which certain people are moving ahead and others left behind. From a postcolonial perspective, such an experience of time is geographically inflected, such that the status of being 'left behind' is quite explicitly and continually mapped. In such a mapping, small things like roads can loom large, simultaneously signifying fulfilment *and* lack, the anger of having never quite as much. From this perspective, localization is a political project, a demand for spatial accountability on the part of external forces. 'What use is the space centre to us?' But it is a demand that can never quite be satisfied, as long as the future lies elsewhere. 'What do we get? Colour TV, but they still think we're savages.' A few years after this struggle over

the space road, another round of disturbances erupted that I followed, this time at a distance.⁴⁸ The issues appeared different in detail, but not in form: a crisis in education involving the stakes of the future, the failures of history, and local place in time.

To Conclude: Transcendence, Provinces and Rates of Decay

Explorers, the history of expansion shows, have a way of ageing badly.
[Patricia Limerick (1994): 14]

What then to say about those space enthusiasts, dreaming of their extra-terrestrial networks? By surpassing the globe would they really leave it behind? In an essay first written in the midst of Space Race fervour, Hannah Arendt (1978 [1968]) wonders what the ‘conquest of space’ might do to the ‘stature of man’. Her hope is for a renewed appreciation of the earth as ‘the centre and home of mortal men’, and a recognition of ‘factual mortality’ among the conditional limits framing science. Her fear is of a reduction of technology to a biological process, and language to the ‘extreme and in itself meaningless formalism of mathematical signs’ which would not merely lower the ‘stature of man’ but actively destroy it [Arendt (1978 [1968]): 279–80]. Amid its anachronistic language and European humanist frame, the essay identifies a crucial aspect of space exploration: the promise of achieving an Archimedean point of sorts, a position beyond the earth from which to survey the planet itself, a location with clear relational implications. The prospect worries Arendt, for she sees the promise as an incomplete one that will be falsely read as an affirmation of power and a transcendence of limits. Once beyond the atmosphere, humans would imagine themselves to be beyond themselves, and thus lose sight of where they are.⁴⁹ Quoting Franz Kafka, Arendt writes that man ‘found the Archimedean point, but he used it against himself; it seems he was permitted to find it only under this condition’ [Arendt (1978 [1968]): 278].⁵⁰

Four decades later, thinking about a small road in the tropics, Arendt’s fears read somewhat differently. For all of the dreams of the world’s space agencies, the mythic allusions in rocket and programme names, the indomitable enthusiasm of space aficionados, the multiple imagination of science fiction, and even the farce of the world’s first space tourist, human spaceflight has yet really to move beyond the earth. In the absence of the sure reflection of either a god or an alien above, meaning is still measured from below.⁵¹

The point is not simply abstract. As the sky fills with satellites, the prospect of extraterrestrial perspective actively materializes, allowing the production and consumption of distinctly global images in support of such diverse causes as corporate profits, environmental awareness and sustainable development. At the same time, however, the import of Kafka’s phrase shifts along with the expanding field of vision. For whom and against whom has this partial transcendence been used – which humans and nonhumans, when and where? Surely the legacy of imperial vision must be

incorporated in the act of looking down. Surely past perspectives of differing elevations, past patterns of contest and association are not simply translated or combined. Under the bright light of a higher lens, the ‘man’ of Arendt’s essay splits asunder, not only through the acceleration of instrumental reason and its lurch beyond the atmosphere, but also through the widening and lowering of a frame of historical reference to include human difference. However much astronauts may still try to birth a singular human in the sky, that new being faces multiple demands of ancestry.

Here I return again to this paper’s theoretical guides, Latour and Chakrabarty, and to the fields of knowledge I have cast them to represent. Latour’s principle of symmetry undoes boundaries and oppositions. Rather than worrying about the ‘legitimacy’ of the modern age in terms of the emergence of modern reason from European religious heritage, in the lineage of Blumenberg (1983 [1976]), he short-circuits modernity altogether, suggesting that its very self-conception represents an illusion. As it turns out, we have never abandoned transcendence at all, only mis-recognized it, and immanence as well. In a world of moving networks we are always somewhere and never quite anywhere at all. From this perspective, a rocket launch could be the perfect conjoining of formerly opposed categories, a moment where the thing becomes present in rising above. It would not come as a particular surprise to most practitioners of science studies to connect satellites and launchpads, however much distance separates them, or to classify them alongside a road as under a heading of transportation and communication. And it would be in keeping with the contemporary concentration on practice to complicate and deflate the progressive vision of a space agency by focusing on unintended side effects and tensions of possible failure to which it must continually respond. Appeals to a broader swath of cultural production around science and technology, including public and popular forms of representation, likewise have grown familiar; indeed, who now can imagine outer space without some reference to science fiction? But one key aspect of the story I am telling deviates from much writing in science studies, even in many of its critical and insightful renditions. In French Guiana, ‘society’ is not a singular form, commonly opposed to nature, but rather an unevenly multiple field of tension. There the historical drama extends ever offstage, fractured not only by internal distinctions but also by a continuing and overriding sense of geographic displacement and difference.

Here Chakrabarty’s postcolonial sense of chronology can be illuminating. In discussing the translation of life-worlds and the dilemmas of minority histories, Chakrabarty [(2000: 111–13)] recognizes what he calls ‘time-knots’, the possibility of multiple temporalities within a single moment. Like Latour’s nonmodern anthropology, the time-knot counters the binary categories of a modernist narrative, unveiling the sacred within the secular in the space between belief and practice, and revealing objects as complexly embedded in time. But Chakrabarty’s vision is never singular; he is not only opposing modern Europe to its medieval past, but also to

Bengal. The concept of the time-knot allows him coherently to represent the conflicting elements of the life-world of modernizing Bengalis, people who fuse continuity and rupture to inhabit more than one universe simultaneously, and do so across geo-historical divides. Thus a stone spice grinder and an electric stove can inhabit the same present; they are both 'now', even though they signify in different temporal directions, standing in for different ages while mediating caste (as well as international) relations. Thus an Indian physicist can both win the Nobel Prize and take a ritual bath, simultaneously maintaining global scientific and local personal spheres [Chakrabarty (2000): 243, 254].⁵² Rather than resolving the tension between contradictory historical frames of abstraction and dwelling, Chakrabarty seeks to maintain it, acknowledging both connection and difference within the 'now'.

In our story, we can extend the principle of the time-knot to space, and consider 'outer space' as a dense tangle of space and time. Such an outer space contains both astronauts and aliens, and flows around both rockets and roads. It is full of the future, but also infused with the past; it is as vast and infinite as we can imagine, but also replete with small and specific struggles. Most crucially, it frames the globe, simultaneously marking the extent of human difference and the limit possibility of its geometric transcendence. Like history, it is inherently contested, but unequally so. To provincialize outer space, then – to the extent that such an endeavour is possible – would not be simply to reduce it in scale, or suggest that it represents but one of many possible framings of the earth. Rather, it would entail recognizing the tensions of human difference running *through* differences of scale, and even *through* a limiting frame.

So at last we come to a moral. Every place is local, but not equally so; in considering points of context we must also factor in their historical mass and inertia, as well as potential isotopes of colonial rule. French Guiana is a setting where a routine form of rocketry directly crosses the remains of less final frontiers. There the very length and direction of networks affect the significance of their presence, the extent to which they can 'be' local. Dreams of spaceflight and more earthly independence both linger along a singularly modest stretch of road. But where one embraces outward motion, the other struggles against the inertia of earlier expansions. In such a setting, stabilization can never quite appear complete, since difference extends into the very combination of time and space framing each narrative position.

At a number of points in this paper I have suggested partial presences and after-effects through time: dreams of space flight within the Ariane project; perceptions of colonialism in French Guiana; the persistence of past representations amid the making of present practice. Thus, in mediating Chakrabarty's provincializing urge and Latour's call for symmetry, I imagine colonial history extending into an uneven decay curve against the sky. Receding from the ground, it still emits radiation, and oversees the boundaries of provinces below. Following this metaphor one would work to plot such a curve, now testing its limits, now recognizing them. Symmetry

can be an excellent methodological principle, but the stakes of dissolving things equally vary in an unequal world. Even if globalization also produces localization, both processes are uneven, and hence unbalanced in their very symmetry of opposition [Appadurai (1996): 178–99; Gupta & Ferguson (1997)]. Whatever happened to empire in the second half of the 20th century, it did not simply vanish. Rather, it lingers on, even beyond the planet, amid the faint beckoning glow of the stars. To move out invites another form of return, a passage forward through the very pasts we might think we are leaving behind.

Notes

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1. A focus on locality may not present an essential barrier to thinking beyond the planet, but it does, I suggest, create a conceptual inertia working against a language of distance, particularly one replete with the vocabulary of empire. For a few rich examples of recent anthropological work concerned with 'place' and placemaking, see: Feld & Basso (1996); Gupta & Ferguson (1997); and Raffles (1999). This genre of work engages with a greater investigation of social space maintained in human geography, much of it inspired by the Marxian legacy of Henri Lefebvre [for example, Lefebvre (1991 [1974])], as well as the spatial turn of cultural theory associated with Michel Foucault. We might also fit appeals to a renewed interrogation of locality in anthropology alongside the discipline's methodological legacy of ethnography and interdisciplinary discussion of globalization. Inasmuch as science studies has taken an ethnographic turn, the methodological point applies in that context as well. Two exceptions that do incorporate extra-planetary vision within configurations of the global are Ingold (1993) and Cosgrove (1994). The longstanding political desire for low level counter-history is well encapsulated by Guha (1996), while Lewis & Wigen (1997) make an extensive case for the need to historicize and disrupt conventional geographic frames.

2. In science studies, the methodological tradition of focusing on confined, clearly demarcated spaces such as laboratories helped bring practice on to centre stage. As David Turnbull [(1993–94): 29] notes, it has long been implicit within the sociology of scientific knowledge that knowledge production is ‘essentially a local process’, even if this sense of locality refers to voice as well as place. For an elegant clarification of the manner in which manipulation of space itself might play a central rôle in the power of technoscience, see Latour (1983).
3. I do not mean to imply that *all* motion is inherently imperial: see de Laet & Mol (2000), for a description of a flexible, self-effacing artefact. Marilyn Strathern also reminds us that pure length of networks may not be the key distinction, but rather their measurability and ownership: see Strathern (1996) & (1999). Here, however, I am focusing on a technical system that is inherently ‘high’, and – in its current form at least – distinctly imperial. As such it is neither ‘fluid’ nor easy to love in de Laet and Mol’s sense, but rather claiming and claimed. At the same time, I accept that its materialization involves a scale and extent of claims that define a ‘limit form’, where quantity of length blurs into a qualitative distinction. Unlike either bush pumps or Strathern’s Melanesian artefacts, satellites demand a planetary orbit for their operation, quite practically treating the world as singular and round.
4. See however Chakrabarty [(2000): 253], and also Prakash (1999). For recent collections of work in postcolonial studies, see Moore-Gilbert et al. (1997) and Schwartz & Ray (2000); for perspectives at the intersection of anthropology and history, see Cooper & Stoler (1997). The South Asian focus of the references cited here (overlapping with the Subaltern Studies collective) is not atypical of post-colonial writing, a point acknowledged by Gayatri Chakravorty Spivak in her foreward to Schwarz & Ray’s collection [(2000): xv]. For a useful discussion of the term ‘modernity’ in colonial contexts, see Mitchell (2000).
5. While Latour credits his colleague, Michel Callon, for the origin of this principle of ‘general symmetry’, he has served as its most prominent champion. For a contextual version of the lineage written with anthropologists in mind, see Hess (1997). The exchanges in the latter section of Pickering (1992) provide another point of orientation: see Collins & Yearley (1992) and Callon & Latour (1992). So too does Latour’s conversational portrayal of his intellectual influences and ambitions: see Crawford (1993). Given the topic of this paper, I must also emphasize that Latour is hardly unaware of the extension of the world beyond the assumed West at the centre of much science studies work. He has long displayed a continuing interest and engagement with several branches of anthropology, and identifies his sojourn in Abidjan in 1973 as a pivotal moment of intellectual formation: see ‘Réponses aux objections’, prepared for MAUSS, No. 17, on his website: <http://www.ensmp.fr/~latour/artpop/P-94MAUSS.html>. Generally, however, he has deployed the ‘non-West’ as a rhetorical resource from which to counter the deep hubris of Western self-representation. See Strathern (1999) for a discussion of Latour’s ‘symmetrical anthropology’ with an eye toward ‘premodern’ hybrids.
6. See Law & Hassard (1999) for some near retrospective accounts by protagonists. Earlier collections edited by John Law (and including contributions by Latour and Michel Callon among others) provide a sense of the general approach: Law (1986) and Law (1991). See also collections focused on the social construction of technological systems: Bijker, Hughes & Pinch (1987) and Bijker & Law (1992). Two studies influenced by an actor-network approach but productively focused on the movement of technologies in non-Western environments are Akrich (1997), and de Laet & Mol (2000).
7. In *We Have Never Been Modern*, Latour [(1993): 128–29] calls this version of transcendence not opposed to immanence *delegation*. Rather than being ‘obsessed with construction of one immanence (*immanere*: to reside in) or the deconstruction of another’ like moderns are, the heroic nonmodern will recognize that ‘[w]e have never abandoned transcendence – that is, the maintenance in presence by the mediation of a

pass'. The sense of 'pass' in question here is that of the ball game, or more generally a process, movement or passage.

8. Latour [(1999: 145–73)] does want to grant things (including microbes) a form of history in addition to politics. Like much of science studies (and unlike most postcolonial studies), his work is felicitously engaged with nonhuman as well as human elements. But while microbes may indeed occupy active historical time, their colonies are differentiated without respect to individuation, or subject formation involving the historical framing of place. In this sense, the project of provincialization would not simply translate, at least in a symmetrical fashion. De Laet & Mol's (2000) account of the Zimbabwe Bush Pump comes closer to the ambitions of Chakrabarty's project, in that it reads human difference into a travelling, transforming object in order to destabilize our assumptions about actors.
9. Along with Warwick Anderson's Introduction to this Special Issue of *Social Studies of Science* (32/5–6: 643–58), see Sandra Harding (1993, 1994, 1998) and Hess (1995) for general calls for plurality in science studies. Laura Nader (1996) seeks a form of symmetry between ethnoscience and technoscience; Paul Rabinow (1989) provides a colonial lineage for aspects of modern planning; Sharon Traweek (1992) explicitly invokes colonial language in *Big Science*; and Donna Haraway (1997) contains elements of anti-colonial argument within science studies. The literature addressing historical forms of colonial science and technical practice constitutes yet another expanding citational universe. See the exchange between Paolo Palladino and Michael Worboys (1993) and Lewis Pyenson (1993) in *Isis* for elements of the polemic, as well as Adas (1989), Headrick (1988) and Pacey (1990), for synthetic, empirically minded overviews related to technology.
10. By 'empire' I mean something more metaphorical and literal than Michael Hardt and Antonio Negri's (2000) recent conceptual use of the term. Their definition of empire as a form of rule without geographic or temporal boundaries sharply distinguishes the concept from imperialism, demarcating eras of world order in terms of the importance of centres and territories [see Hardt & Negri (2000): xii–xiv]. Here I am concerned with boundaries both smaller and larger than those they focus on: a distinctive assimilated former colony below, and a common limit of the atmosphere above. Thus I will be tracing a more precise set of chronologies with a looser vocabulary. I find it telling that while their text remains earthbound and mute about outer space, the cover image chosen for their book (like many works addressing globalization) incorporates an image of our planet, shot from above the blue and white swirl of its clouds.
11. As Donna Haraway [(1989): 133–85] notes in her heretical history of primatology, decolonization and the dawn of space exploration not only overlap in time, but also share a few elements of biomaterial and images. It is also worth underscoring again that the vision of the cyborg takes shape amid the dream of interstellar travel: see Clynes & Kline (1960); also Haraway (1997): 51.
12. In this respect, I believe my topic typical of the larger subject that surrounds it. The interpretive dilemma posed by modern science and technology lies less in decoding covert meanings than in taking the obvious seriously. True to form, this point itself is hardly original (the quixotic gestures of Latour and Haraway, two of science studies' most externally influential prophets, both bear witness to it), but ever worth repeating. What matters is framing the obvious, the current, the unavoidable in such a way as to re-establish its significance.
13. Here I acknowledge the many people who caution against over-simplifying either outer space or empire, especially Hugh Raffles. As he memorably puts it, '*Star Trek* isn't such a dumb show' (personal communication, April 2001). Indeed, and history is rich with a heterogeneous set of potential aliens, from Neanderthals over the next ice sheet to mysterious ships above Texas: see Susan Lepselter (1997), and Sofia (1987). In his official letter announcing a triumphal return to Spain, Columbus himself included a comforting note that he had not, as yet, encountered any monstrosities [Hulme & Whitehead (1992): 14]. See also Greenblatt (1991) for further context and analysis of the New World encounter.

14. For more on Verne's life, politics and complicated combinations of unabashed progressivism and pessimism, see Chesneaux (1972) and Martin (1990). One of the most direct connections in the generation of fantastic fact runs through Arthur C. Clarke, author not only of many classic works of science fiction, but also of the original 1945 paper proposing satellite communications in *Wireless World*: Clarke (1968 [1945]).
15. Artillery aside, Verne's vision contains a number of elements that correspond eerily with the eventual Apollo flights, from choice of launch site to the general conditions of space travel. Even more striking, however, and significant for this discussion, is Verne's uncanny prophecy of key social and cultural elements of the Space Age. Setting his tale in the aftermath of the then ending American Civil War, our Frenchman identifies the vital inertia of a military industrial complex (albeit with a weak state overshadowed by civil society), through which machinery born of conflict continues to multiply beyond the cessation of hostilities. In the anomie of the Baltimore Gun Club and the technical enthusiasm of its well-amputated gun designers, the end of necessity marks the beginning of reapplication, and transmutation of war into experiment. Shooting a cannonball to the moon serves as a substitute for the energy of combat. Verne also predicts the importance of public relations to the space enterprise, and the critical romance of astronauts in further translating technical experiment into human exploit. Only after a daring Frenchman demands passage on the lunar cannonball does the matter become a true quest, worthy of dramatic investment. From the mouth of the giant gun, named for Columbus, would issue a new master adventurer: see Verne (1958 [1865/1870]) and (1966 [1865]).
16. I have slightly modified the unattributed translation of this authentically cheap English abridgement, as well as engaging in some abridgement of my own. For the original French, see Verne (1974 [1870]): 113–16.
17. I do not mean to imply that all imperialism was an afterthought, only recall – along with Verne – that some actions can be partly unplanned. The postcolonial focus on significant entities like India can overshadow the record of backwaters and unprofitable atolls. For a discussion of British adventures in neighbouring Guyana, see Rivière (1995), and for a criticism devoted to the actual practices of cartography, Burnett (2000).
18. Rounding out the crew of lunar voyagers we have Friede, the adventurous woman of the title who also lends her name to the rocket; Hans Winddeger, the cowardly fiancé she will ultimately discard for Helius; and Gustav, a stowaway boy who reads pulp comics about space. Collectively they carry with them a relatively conventional plot involving misunderstandings and a romantic triangle, culminating in Helius and Friede's remaining behind as a lunar Adam and Eve.
19. See Ordway & Liebermann (1992): esp. 113–23; also McCurdy (1997) and McDougall (1985): 411–14, on the moon landing.
20. For expansion on the etymological emergence of 'colonialism' from agricultural settlement, see Johnston & Lawson (2000), and Klor de Alva (1995).
21. I attempt a more extensive discussion of the Guiana space centre and its historical context in Redfield (2000). For a specifically Maroon perspective, see Price & Price (1989). For ethnographic background on the European Space Agency in Europe, see Zabusky (1995). For a detailed, official history of ESA, its organizational antecedents and projects see Krige & Russo (2000a) and (2000b). Carlier & Gilli (1994–95) provide the same for CNES (*Centre National d'Etudes Spatiales*), the French national space agency.
22. Dolman [(2002): 60–85] describes the significance of various orbits and the optimal launch sites for achieving them within a strategic perspective of geopolitics. Along the way, he notes a favoured fact of CSG: an Ariane launch from Kourou enjoys 17 percent greater fuel efficiency than a similar launch from Cape Canaveral (*ibid.*: 77–78).
23. For more on the emergence of international conventions and technical norms related to satellite communications, see Slotten (2002) and King-Hele (1992). For a broader historical background, see Hugill (1999).

24. See European Space Agency (ESA), 'Our Inheritance – Our Future: Space', an informational brochure released in 1989. This example is far from unique. CSG runs tours for VIPs, school groups and the general public, all of which stop at the museum. In 1993, the total number of visitors just exceeded 25,000 [Marot (1994)]. The internal magazines of CNES (*CNESQUISEPASSE?*) and CSG (*Latitude 5*) regularly feature anniversary notes. In addition to marking anniversaries of its own establishment and accomplishments, CSG lauds the landmark achievements of others, particularly NASA's moon landing. In my own favourite example of the extremes of celebration, engineers built a functioning model of the rocket used by the Francophone Belgian cartoon hero, Tintin, for a fictional flight in 1953. They did this not once but twice – in 1989, and then again in 1994 – to mark the 20th and 25th anniversaries of the American landing. As the logo for the event read: '*Du rêve à la réalité, il n'y a qu'un pas* [From dream to reality, it's only a step] . . .': see 'Lancement de la fusée RG' (a miniature version of a standard Ariane press packet), issued in 1994 by the Centre Spatial Guyanais and the Club de Lancement de Mini-Fusées de Kourou.
25. The space operation in French Guiana formally involves three entities: CNES, the French national space agency of which CSG is a part and which runs most daily operations; ESA, the European space agency coordinating international cooperation, investment and development; and Arianespace, a state-subsidized corporation that oversees and markets Ariane launches. These organizations (sometimes jokingly referred to in Kourou as 'The Trinity') do not always share identical goals, even at a representational level; unsurprisingly, ESA and CNES are the most invested in spaceflight and non-commercial adventure. Relative to French Guiana, however, distinctions between the three pale, as all are more focused on the launch base than the land around it. The Ariane-5 rocket, we should also note, was originally designed to be capable of carrying the Hermes space shuttle: see European Space Agency (ESA), 'Hermes' (informational brochure, released 1991).
26. See Jolivet (1982): 470–74, for comments on the base in 1971.
27. See also the 'Conférence d'Information, Jeudi Oct 1, 1964', published in Guyane's main news source of the day, *Radio Presse* (6–8 October 1964).
28. Letter to the editor, signed J.M.D., *Rôt Kozé*, No. 45 (July–August 1994), 2.
29. The dam did implicate the space enterprise as the largest (if far from only!) consumer of energy in French Guiana, although CSG did not directly control that project. While the space centre had even less to do with the road to Brazil, rhetoric employed by a group of Guyanais business and political leaders positioned the environmental groups protesting against it alongside the space centre as a continuing imposition of 'European' interests: see Redfield (2000): 231–44.
30. For a classic description of 'Route Zero', see Londres (1975 [1923–27]): 68–73, who notes that 50 years of convict labour had produced 24 kilometres of road.
31. In 1992, French Guiana counted about 60,000 registered automobiles (approximately 1 for every 2 people), running over a mere 400 km or so of paved road, and some 900 km of more questionable surfaces. That year there were 541 reported accidents, resulting in 826 injuries and 50 deaths [INSEE (1993): 117].
32. CNES (*Centre National d'Etudes Spatiales*), '1964: Conception et naissance du Centre Spatial Guyanais' (1994), a press release from a future authorized history of CNES, and original reports: also published in *Antilla*, No. 582 (29 April 1994), 21–22.
33. In providing this retrospective summary, I am condensing news accounts (primarily in the departmental newspaper, *France-Guyane*, and on the official TV and radio network, RFO) as well as personal interviews from 1994, 1993 and 1992. The official rationale of CSG officials became clearer in statements after the conflict arose and public justification was necessary. However, subsequent statements did not deviate dramatically from earlier explanations in content. While space officials did not play up a concern over work disruption due to demonstrations as well as terrorism or espionage, I have added it in, given prior discussion of the topic during a general strike across the department in 1992. Concern over espionage was vividly demonstrated by a breathless 1997 report of rumours of American spies: see Gallard (1997).

34. Bertrand Villeneuve, 'La dot du spatial', *France-Guyane* (16 July 1994), and Alexander Miles, 'Fears Grow over Ariane Centre Isolation in Guiana' (Reuters wire report, 13 July 1994).
35. 'Le préfet entend crever l'abcès', *France-Guyane* (16 July 1994).
36. Frantz Montoban, 'Le MDES demande un référendum', *France-Guyane* (27 July 1994).
37. I attended the rally and recorded the speakers' comments. Despite its success at gathering signatures, MDES was not a particularly large movement; its meetings and rallies at the time attracted between 50 and perhaps 300 people.
38. In addition to the press releases of MDES, see 'Fermera, fermera pas', *France-Guyane* (5 August 1994). My portrayal of the social context (like much of the rhetoric within it) minimizes the vast demographic shifts that have occurred in the region since the 1960s. The official population figure of French Guiana in 1999 was 157,213, of whom some 40 percent are Guyanais Creole, 3 percent Amerindians, 3 percent Maroons, 1 percent Hmong and 12 percent European. The remaining 40-odd percent are lumped together as 'Chinese, Lebanese, Brazilians, Haitians and Surinamese'. What is not specified is that the first two categories of this latter group together would amount to only about 1–2 percent, with the last three comprising the rest (see <http://www.outre-mer.gouv.fr/domtomb/guyane/>). These estimates of total population (and especially its illegal and semi-legal immigrant component) are most likely conservative. Thus the MDES claim to locality must also be understood as an effort to direct multiple lines of tension against the French state, and not simply as a claim to native status.
39. MDES, 'Lettre ouverte du MDES', issued publicly in Cayenne on 15 July 1994. The description of Kourou as a 'white' town and the reshuffled acronym 'CSE' were common features of anti-colonial rhetoric at that summer. See articles and letters (largely written in French, which has generally replaced Guyanais Créole as the department's *lingua franca*) published in the radical monthly associated with MDES, *Rôt Kozé*.
40. 'Le PSG prend position', and 'Walwari parle de trahison', in *France-Guyane* (30 July 1994).
41. Notably, CSG invited the recently legalized channel ACG (positioned as a Creole station, if largely broadcasting in French), as well as the state television RFO.
42. While, officially, CSG vigorously denied having any desire for a proprietary port or airport, informal conversation suggests that at least some of its employees had allowed themselves to fantasize wistfully about the possibility, which would circumvent what they perceived to be inefficiencies of the public facilities.
43. CSG effectively side-stepped one of the key complaints of their opponents, the question of why the closure was permanent. For them, public access meant arriving as a tourist at the centre's museum, or officially witnessing a launch and hence participating in the space adventure, not weekend fishing at a creek or farming by the side of the road.
44. See Haraway (1989): 139, and Zoe Soufolis, cited in the same text (*ibid.*: 400–01).
45. For a description of the public relations campaign, see Alex Miles, 'French Space Agency in "Right Stuff" Campaign' (Reuter News Wire Feature, 20 November 1994).
46. On the emergence and normalization of development discourse, see also Cooper & Packard (1997) and Ferguson (1990).
47. The expropriation in 1965 displaced some 600 people, a miniscule disruption on a Metropolitan scale, if not insignificant in the demographic context of French Guiana. The symbolic resonance of the land transfer would prove even greater, however, in terms of ethnic politics. To amplify the account in Carlier & Gilli (1994–95): 284, see also Jolivet (1982): 443–49, and Mam-Lam-Fouck (1992): 293.
48. French Guiana would experience major episodes of social unrest in 1996 and 1997 (this time spearheaded by students protesting overcrowded, underfunded schools and high youth unemployment), as well as further calls for increased autonomy thereafter. In 2002, the charismatic founder of Walwari, Christiane Taubira, would become a candidate for the French presidency, running on the *Parti Radical de Gauche* (PRG) platform. While in the island of Reunion, she made the following statement on the

status of France's overseas departments: 'If the "nationalism" we talk about does not mean political independence, which is no longer relevant in Reunion or in [French] Guyana, if that nationalism means that we need to continue decolonization at economic, social and cultural levels, by developing our institutional frameworks where necessary, then I agree': quoted in Christophe Rocheland, 'Black Presidential Aspirant Calls For Reunion's Freedom' (Panafrican News Agency [PANA] Daily Newswire, 2 April 2002).

49. Hans Blumenberg echoes Arendt's concern in his own remarks on the space age, urging a return to earthly reason [Blumenberg (1987 [1975]): 685]. Just as the Bandung conference would offer an alternative non-aligned vision amid the early Cold War, the image of the earth from space, most successfully mobilized by the environmental movement, anchors a variety of counter-narratives to celestial expansion: see Cosgrove (1994). At present, most of the major space agencies have extended the logic of the 1957–58 International Geophysical Year (the justification for the first satellite launches) into a comprehensive programme of earth science and management from above, incorporated into the exploration drive and conducted in the name of peace: see, for example, the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, available at <http://www.oosa.unvienna.org/unisp-3/>.
50. Arendt's vision of an Archimedean point of false transcendence echoes through Donna Haraway's later admonition about the 'god trick', and James Scott's analysis of 'seeing like a state'. Each formulation presents a different alignment; while Arendt is primarily concerned with the general corruption of enlightened human reason, Haraway distrusts patriarchal vision amid science, and Scott the reordering perspective of technocratic planning. In Arendt's version, the space adventure risks becoming a flight of Icarus; Haraway and Scott draw different political morals about the dangers of disembodied points of view. Yet all three authors present us with a spatial measure of modern hubris, one which collectively warns against mistaking an ascendance of instrumental reason for the omniscience of the divine. See: Haraway (1988) and Scott (1998); see also Fernando Coronil's review of Scott [Coronil (2001)], and Pratt (1992).
51. Noble (1997): 115–42, describes the significant rôle of religion played at NASA. The greater relation of European modernity to European religious heritage is complex, and implicated in any effort to interrogate any definition of modern status; even Latour's proclamation of a nonmodern alternative mobilizes the figure of a crossed-out god: Latour (1993): 32–35. The resistance to secularization expressed by Hans Blumenberg (1983 [1976]) has the utility of distinguishing progress from salvation; for the space enterprise, the voyage continues beyond the moment of ascension. The appearance of Dennis Tito as the original space tourist (aboard a Russian rocket and equipped with an American passport and the name of a non-aligned socialist) may mark the final closure of the Space Race, if not the Cold War. Again, I thank Hugh Raffles for his wry commentary.
52. In the latter example, Chakrabarty recounts the possibly apocryphal story of C.V. Raman in order to underscore the possibility of reassigning reason to another rôle than that given to it in historicist and modernist thought. While he does not specifically note technology as a source of time-knots, reflection about the designation of 'ages', stoned to space, would indicate that technical systems play a key rôle in the discursive constitution of multiple, hierarchically coded temporalities. See also Gabrielle Hecht's paper in this Special Issue, for her description of the 'nuclear age' and useful deployment of the term 'conjugation' to describe partial transformation as well as reproduction out of empire: G. Hecht, 'Rupture-Talk in the Nuclear Age: Conjugating Colonial Power in Africa', *Social Studies of Science*, Vol. 32, Nos 5–6 (October–December 2002), 691–727.

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Peter Redfield is Assistant Professor of Anthropology at the University of North Carolina at Chapel Hill, and author of *Space in the Tropics: From Convicts to Rockets in French Guiana* (California UP, 2000). He remains interested in issues of space, large and small, while at work on a project

exploring techniques and ethics in the humanitarian organization, *Médecins sans frontières*.

Address: Department of Anthropology, University of North Carolina at Chapel Hill, Alumni Hall 301, CB 3115, Chapel Hill, North Carolina 27599-3115, USA; fax: +1 919 962 1613; email: redfield@unc.edu