

The background of the book cover is an aerial photograph. The top half shows a large, dark blue body of water, possibly a bay or a large lake, bordered by a green shoreline. The land around the water is a mix of green and brown, with some small buildings and structures visible. The bottom half of the cover shows a more detailed view of the land, with a grid-like pattern of fields or agricultural plots in various shades of green, brown, and red. The overall image has a high-contrast, somewhat abstract quality.

2 Anglophone
Postcolonial Studies

SCIENCE, CULTURE, AND POSTCOLONIAL NARRATIVES

// Edited by Anton Kirchhofer
and Karsten Levihn-Kutzler

HEIDELBERG
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SCIENCE, CULTURE, AND POSTCOLONIAL NARRATIVES

ANGLOPHONE POSTCOLONIAL STUDIES 2

Series Editors

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Cecile Sandten


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Anton Kirchhofer and Karsten Levihn-Kutzler

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Introduction—Postcolonial Modernity and Narratives of Science

In 2019, Oxford University's St John's College advertised for a two-year post-doctoral research assistantship in order to research the college's "involvement in colonialism."¹ The project *St John's and the Colonial Past*, as reported in *The Guardian*, was supposed to uncover "benefactions to St John's and the alumni who served in the empire" and "investigate the monuments, objects, pictures, buildings that evoke the colonial past" (Adams 2019). The project is part of a wider movement among museums, universities, and other institutions to address the constitutive entanglements of their own institutional histories with the imperial and colonial histories that unfolded around them and shaped them. This, in turn, might be understood as heralding a shift in the position and relevance of 'the postcolonial'—the gaze is no longer directed towards the former colonies and their engagement with the material and ideological legacies of colonialism; here, the metropole turns the investigating gaze back onto itself. But the news item reporting on the position also reveals the limitations such self-reflection still has. The report in *The Guardian* adds: "The college said the post would be *unique within Oxbridge* as an effort to investigate its own history [...] and hopes it will '*set the standard for future work in other institutions*'" (Adams 2019, both emphases added). The investigation of St John's colonial past is meant to underline the continued thought-leadership of the metropolitan institution; it is seen as a demonstration of the ongoing excellence of the two oldest British universities, an asset in a global competition for innovative and pioneering research as well as in the internal competition among colleges as peers and competitors. Paradoxically, then, the project may reinforce, rather than addressing, the constitutive disparities of global knowledge

1 The editors gratefully acknowledge the support of the Volkswagen Foundation in funding the research on which this introduction is based.

production which have their origins in the colonial entanglements the project investigates.

Postcolonial studies has a strong record of calling into question the modernization narrative long current in 'the West'—the Euro-American self-perception of innate social, political, economic, scientific, literary, and artistic global leadership (see, for instance, Lipset 1959). In this worldview, the history of colonialism was a somewhat peripheral and supplementary phenomenon, a process aiming for 'the spread of civilization' in which regrettable mistakes had been made but which still would eventually allow the formerly colonized nations to 'catch up.' It must be noted, of course, that within the framework of postcolonial studies, that account has been substantially and effectively challenged in favour of a paradigm of a co-production of modernity between colonizers and colonized, although under conditions of disparity and disappropriation (see, for instance, Gilroy 1993; Chakrabarty 2000). Nevertheless, the position of postcolonial studies in academia was itself framed by the after-effects of the modernization discourse. The gradual establishment of postcolonial studies in academia, as an added component in a range of disciplines, came about in connection with the 'cultural turn,' alongside cultural studies, gender studies, gay and lesbian studies, disability studies, and other intersectional allies. The adoption of postcolonial concerns in departments of arts and humanities certainly did not progress evenly, with some disciplines and some universities taking the lead and others following more slowly or not at all. The same is true for the establishment of professorships in postcolonial studies. But the debate about these generally was framed as a question of supplementation—a debate about the need for additions to established mainstream concerns and canons which have supposedly formed independently of postcolonialism's 'supplementary' concerns.

Over the past five or ten years, however, it increasingly seems that 'the West' has finally begun to give wider public recognition to what we suggest should be described as its own *constitutive postcoloniality*. What began in the 1960s and 1970s as a special interest, as a 'niche' concern in academia, is now coming to be recognized more and more as the constitutive feature of modern societies. Adopting such a perspective entails a more general recognition of what we might call the constitutive postcoloniality of contemporary structures, institutions, and processes of knowledge production. A postcolonial perspective is, then, no longer an optional extra added to certain disciplines in the humanities but a part of the history of the formation of disciplines and institutions of knowledge production across the board. It gives visibility to historical entanglements as well as continuing structural asymmetries and disparities in contemporary knowledge practices.

The growing recognition of the constitutive postcoloniality of modern societies and their institutions of knowledge production, far from rendering the need for postcolonial critique obsolete, creates new directions and challenges for postcolonial inquiry. As is shown by the report on *St John's and the Colonial Past*, an example chosen from a range of similar instances emerging since the late 2010s (see, for instance, Weale 2019), acknowledging the colonial past does not necessarily mean acknowledging the past's continuing structural relevance for the present. By keeping colonial history disconnected from the present, St John's acknowledgement of its colonial past comes to legitimize its claim to a position of leadership in a global imaginary of knowledge production, in which the imperial centre still retains the mantle of the intellectual vanguard. Historical revisionism can thus be implemented in ways that reinforce the global hegemonies in institutional frameworks for knowledge production, instead of questioning them. The 'grand narrative' of "The Spread of Western Science" (Basalla 1967), a central element of twentieth-century modernization narratives, remains the narrative on which St John's stance is predicated: a claim for academic leadership within a set of research institutions ('Oxbridge') which, in aggregate, share a claim to global intellectual leadership. What the project's research angle, as reported, does not appear to envisage is a revision of the unilateral and Eurocentric conception of agency in the progress of scientific research and knowledge production.

This shortfall is especially regrettable at a time when science and questions about the status of knowledge have become central to urgent geopolitical issues, such as climate change and pandemic diseases. Science is both more urgently needed and increasingly embattled, both in postcolonial contexts and in the West. Rather than simply shoring up a Eurocentric version of scientific authority, we believe that it is urgent to address science's entanglements with colonial power and its complex and ambivalent position in postcolonial cultural and political contexts. But as of now, the cultural imagination of this connection has rarely been made a focus of research. Our goal in this volume is to promote a multi-perspectival reflection on the role of science and related knowledge practices in narratives of postcolonial modernity and on the cultural conceptualization of science in postcolonial societies around the world.

In this introduction, we want to provide a framework for this reflection. In order to do this, we will first establish the colonial origins not of science per se, but of the identification of science with Western cultural authority, a strategic misrecognition that persists until the present day. Drawing on insights from postcolonial science and technology studies, we will then turn to two examples for cultural narratives of science in postcolonial contexts.

While both of these try to reclaim the cultural authority of science for other, indigenous knowledge systems, they both paradoxically reproduce the terms of Western grand narratives about the spread of Western science. We suggest that moving beyond these narratives requires an understanding of the polyvalence of science as a signifier and a careful analysis of how ‘science’ operates in any given narrative. Finally, we will briefly introduce existing critical perspectives that form the background to the contributions in this volume—literature and science studies, postcolonial literary and cultural studies, postcolonial science and technology studies, and environmental criticism. Our aim with this volume is to encourage a dialogue between these perspectives that will ultimately lead to a critical practice that reckons with the complex intersections of science, narrative, and postcolonial cultures.

Strategic Misrecognition: Colonialism and the Narrative of the ‘Spread of Western Science’

In the foregoing brief discussion of *St John’s and the Colonial Past*, we have taken that project as an indication of the need for new accounts that connect historical insights with contemporary practice. Evidently, there is still a disjuncture between, on the one hand, the emerging new historical perspectives and, on the other, the cognitive, structural, and institutional frameworks that shape the processes of knowledge production from which these revised perspectives emerge. In other words, there is a dissonance between a genuine reckoning of St John’s with its colonial past and the narrative that institutions like St John’s tell to explain global structures of knowledge production. We take this as an exemplary illustration of the need in our current discussions both within and beyond postcolonial studies for a closer and more differentiated engagement with the nexus of science, culture, and postcolonial narratives, both in a historical and a contemporary perspective.

A new narrative of the history of science alert to the entanglements between science and the histories of colonialism and imperialism will have to contend with aspects such as the following: colonial resource extraction, plantation economies, and the slave trade have provided foundational capital for many scientific institutions in Europe; colonial power has facilitated the extraction of scientific objects—such as mineral, plant, and animal specimens, cultural artefacts, and human remains—for the benefit of European institutions; and specific disciplines, from cartography and tropical medicine to linguistics and anthropology, have directly

contributed to colonial infrastructures and the exertion of imperial power. Moreover, as we have seen in recent debates about the decolonization of scientific institutions, colonial legacies also persist in structures of systemic racism restricting access to science and higher learning as well as in the Eurocentrism of university curricula.

While all these historical connections are known and documented, though perhaps not universally recognized, postcolonial critique must go a step further and add to our perspective a more fundamental interrogation of the ideological function of a particular cultural narrative of science. The historical connections highlighted above, we suggest, have been obscured by the narrative of ‘the spread of Western science,’ a particular cultural narrative, within whose context science’s claim to universality—i.e. its indifference to cultural context—is paradoxically yoked together with a claim for Western cultural hegemony. Even though in the social sciences, especially in the history and sociology of science, this narrative no longer holds the sway it once enjoyed, we have already noted that the ongoing structural and institutional effects of this cultural narrative can still be seen operating, for instance, in the way that St John’s College framed its endeavour to engage with its own connections to the history just invoked. The search for different and more appropriate narratives will need to involve a critical evaluation of the role which the long-accepted cultural narrative about ‘Western’ science and its historical ‘spread’ has played in obscuring the geopolitics of knowledge production and the transcultural exchanges and entanglements in the history of science—and how it still shapes the structural and institutional features of our own research and critical discourse.

Taking the constitutive postcoloniality of modern science seriously thus not only involves problematizing specific histories and policies that connect the history of science with colonial and imperial projects; it also challenges us to recognize that the widespread cultural narrative of the ‘spread of Western science’ was and is a *strategic misrecognition*, operating as a particular conjuncture of science, culture, and *colonial* narrative, by combining a claim of the universal validity of scientific knowledge with a claim of the cultural hegemony of the West. The narrative of science as a specifically and perhaps exclusively ‘Western’ phenomenon—emerging in early modern Europe and intrinsically linked to processes of modernization and secularization—constitutes a specific element in the order of colonial discourse. As such, it has played a highly impactful role in legitimizing colonial and imperial projects. Understood as the explicit opposite of native ‘superstition,’ science provided the contrasting foil to the assumed irrationality of colonial subjects, which justified—mandated,

even—the application of colonial rule. To take a particularly notorious historical example, Macaulay’s infamous *Minute on Education* positions English, amongst other qualities, as the language of science, which furnishes its speakers “with full and correct information respecting every experimental science, which tends to preserve the health, to increase the comfort, or to expand the intellect of man” (1920, 110), while the learning of Sanskrit and Persian constitutes “not merely a dead loss to the cause of truth” but “bounty-money paid to raise up champions of error” (114). The scientific claim to universal truth vouched for the ubiquitous untruth and pervasive irrationality of non-Western forms of knowledge and knowledge generation; the codification and disciplining of knowledge in the sciences recast all other knowledge as un-methodological, anecdotal, and undisciplined. Science thus became instrumental in establishing and maintaining colonial difference and “the subalternization of knowledge built into it” (Mignolo 2000, 4).

But what perspective emerges once we recognize the identification of ‘Western’ and ‘science’ as a strategic misrecognition, a cultural narrative aiming to universalize cultural and geopolitical hegemony? How can we find more comprehensive and appropriate narratives of the institutional and conceptual history of science, narratives that take the geopolitics of knowledge production and transcultural exchanges and entanglements in the history of science into account? These questions will become even more acute when we turn the lens onto representations of science as a specific form of knowledge production in the context of colonial and post-colonial societies.

Strategic Reversals: Postcolonial Critiques of Science, Identity Politics of Knowledge, and the Afterlives of Modernization Narratives

Both in a historical and a contemporary perspective, there is a demand for modes of reflecting on and accounting for the complex ways in which ‘science’ operates in a widely varied set of real-world contexts, as well as in recent and urgent critical debates. After all, science has become relevant in some of the most urgent and existential questions of our time, pertaining to issues like struggles for environmental justice, postcolonial responses to climate change, the debate about the concept of the Anthropocene, or the cultural and political responses to pandemics from HIV/AIDS to COVID-19. Some postcolonial nation-states have emerged as powerful ‘players’ in a global landscape of competitive knowledge production themselves; yet

the position of science in the self-conception of postcolonial societies is often vexing and contradictory. And in spite of its historical connections to histories of colonial oppression, science was also part of the promises of post-independence modernity. Science education may offer marginalized and disenfranchised populations chances for improvement and emancipation, but science also has been co-opted by parochial nationalisms opposed to such projects. Science and modern technology are deeply implicated in resource exploitation and environmental degradation, but they also provide diagnostic tools and technological remedies necessary to protect and restore postcolonial environments. While it is far from exhaustive, this list of aspects may be sufficient to illustrate the polyvalence of science, both in its real-world effects and as an ideological construction.

In trying to better understand the complex and often ambivalent role of science in postcolonial contexts, we can draw on the work of scholars both in the history of science (see MacLeod 2000) and in science and technology studies (see Harding 1998, 2011; Anderson 2002, 2009). Over the past three decades or so, these scholars have worked to contest and displace the narrative of the ‘spread of Western science’ and begun to explore more multipolar conceptions of agency in the progress of scientific research and knowledge production. Researchers in the postcolonial history of science have sought to move beyond concepts that posit a stark opposition between ‘Western science’ and ‘indigenous’ or ‘traditional knowledges,’ drawing attention to the local and the global entanglements in the production of scientific knowledge (see, for instance, Konishi et al. 2015). Many current approaches emphasize reciprocal exchange and dialogue, describing and criticizing existing imbalances and inequalities while maintaining a focus on networks of knowledge and the circulation of knowledge within these networks. Working from both contemporary and historical perspectives, scholars have explored the connections between colonialism and the practice and progress of science (e.g. Nandy 1988; Baber 1996; Chakrabarti 2004), describing the co-production of scientific knowledge in colonial or transcultural encounters and tracing the global circulation of knowledge (e.g. Raj 2007; Günergun and Raina 2011; Renn 2012; Lightman et al. 2013). A lively and growing body of research has emerged over the past few decades, focused on exploring methodologies and angles of inquiry that have the potential to take us beyond the reductionism of the stereotypes that have been allowed too long to govern the received cultural perspectives on science and culture (see, for instance, Smith 2018).

While this recent work in the history of science and in postcolonial science and technology studies thus provides a basis for a less culturally biased understanding of the history of science and of the geopolitics of

knowledge production, it does not provide a ready-made, all-encompassing alternative narrative of the history of knowledge production. This may be due in part to the fact that some proposals for alternative grand historical accounts, such as, for example, the ‘globalization of knowledge’ (Renn 2012) arguably still negotiate, revise, and update versions of the ‘spread of Western science’ narrative. Arguably, the same difficulty besets a range of other narratives about science that have emerged amidst political and social debates in postcolonial contexts.

A frequent postcolonial response to the entanglement of science and colonialism has consisted in the proposition of counter-narratives that revolve around validating—and even valorizing—other knowledge practices under rubrics such as alternative sciences, indigenous knowledge, and traditional ecological knowledge. In critical discourse, a strategic reversal first manifested amidst the emergence of postcolonial science and technology studies in the 1990s, when sociological and anthropological critiques of science’s supposed objectivity and universality (see Woolgar and Latour 1986; Knorr Cetina 1999) were combined with a ‘rehabilitation’ of non-Western knowledge practice (see Harding 1998, 2011). In more recent debates about the decolonization of universities and other scientific institutions and research methods, such indigenous practices are often seen as emancipatory and holistic practices of knowing, particularly adept, for instance, in understanding ‘environmental’ problems as a complex web of social, ecological, and spiritual factors (for a succinct summation, see Knopf 2015).

While the reappraisal of, and respectful engagement with, these knowledge practices can only be welcomed, critics have also pointed to the danger of an uncritical reification of indigenous ‘alternative’ sciences, which would leave the colonial dichotomy of science and its others intact and merely invert its normative value (Green 2012, 4; see also Baber 2002, 2003). Such a strategic reversal of the traditional master narrative of the spread of Western science may lead to its own conceptual impasses, giving rise to what Green calls an “identity politics of knowledge” (2012, 5). A particularly striking example of the theoretical and ethical quandaries produced by this type of reversal are the South African ‘science wars’ surrounding the AIDS crisis, including the failure of the South African government to provide anti-retroviral drugs in the early 2000s. This failure has been widely attributed to the scepticism of then president Thabo Mbeki and minister of health Manto Tshabalala-Msimang about the scientific consensus—fuelled by distrust in the international pharmaceutical industry and a conviction that the AIDS crisis was part of a larger crisis of poverty and malnutrition. Besides the horrific death toll to which Mbeki’s policies contributed, they

also resulted in a public debate about the authority of science and indigenous African knowledge practices with puzzling constellations:

AIDS activists' defence of a pure science, apparently untainted by any human interests, has put its supporters in an uncomfortable alliance with 'Big Pharma.' Indigenous knowledge proponents' defence of a pure traditionalism, apparently untainted by any human interests, sets up an uncomfortable alliance with elites who use the idea of 'tradition' to insulate themselves from criticism from 'inside' ("cultural pollution!"), and criticism from 'outside' ("you have no right to speak!"). (Green 2012, 3)

The rejection of the scientific consensus about AIDS is the correlative of an identity politics of knowledge. It is predicated on a counter-narrative which recasts science as Western imperialist propaganda imposed on the colonial world while recentring indigenous African knowledge practices as true and authentic. Apart from the severe human cost resulting from these policies, such a cultural stereotyping of science as 'Western' then has a hard time avoiding the trap of reproducing and reinscribing colonial dichotomies such as those postulated by Macaulay by simply mirroring them in reverse—ultimately producing nothing more than a new form of strategic misrecognition.

The position of science in public discourse in India is similarly difficult to track by using a simple binary between Western science and indigenous or "subalternized" knowledge. As Gyan Prakash has shown, the emergence of India as a secular nation-state itself was underwritten by invoking science "to authorize an enormous leap into modernity, and anchor the entire edifice of modern culture, identity, politics, and economy. The very existence of India appears crucially dependent upon the stability of the apparatuses and practices it designates as rational" (Prakash 1999, 12). More recently, however, the connection between science and Indian secularism has been undermined by Hindu nationalists who have sought to ideologically co-opt science. Claiming to see modern scientific concepts and technology anticipated in mythological narratives and Vedic scripture, Hindu nationalists invoke ancient 'Hindu science' to legitimize Hindu supremacy (see Subramaniam 2019; Nanda 2016). In whatever guise it manifests, the mounting of a counterclaim has emerged as the preferred way of contesting colonial forms of the cultural stereotyping of science. But to present a claim of precedence for 'Eastern' science, in whatever form it is conceptualized, is still to maintain the continuity of the dynamics driving the quest for the cultural prestige and political legitimacy that is apparently to be derived from the idea of precedence, superiority, or exclusiveness in the practice of 'science.'

While such ideological co-option of science may have less immediately lethal consequences than the rejection of medical and epidemiological advice, some critics have warned that once science is reduced to a mere cultural signifier and its claim to universal validity is conceded, criticism foregoes whatever emancipatory potential science might have in a social context such as the Indian caste system. As Meera Nanda polemically puts it:

The oppressed Others do not need patronizing affirmations of their ways of knowing, as much as they need ways to challenge these ways of knowing. They do not need to be told that modern science is no less of a cultural narrative than their local knowledges, for they need the findings of modern science, understood as transcultural truths, in order to expose and challenge local knowledges. (Nanda 2000, 209)

Thus, neither a wholesale rejection of science in favour of other, indigenous knowledge systems nor the rhetorical appropriation of science as an originally indigenous knowledge system takes us beyond an 'identity politics of knowledge.' These alternatives work not by displacing but by reframing the concept of 'Western science.' They preserve a binary that pitches colonial 'Western science' against its 'postcolonial others,' even as they seek to redress the balance between the two. By the same token, it seems fair to say that the strategic reversals of the traditional narrative share that narrative's character of strategic misrecognition, even though they represent different versions of it. Pursuing what may be described as a strategy of geopolitical reversal does not fundamentally alter the perception of 'science' which still figures here as an activity and a body of knowledge with universal validity, but at the same time entangled with cultural privilege.

What the situation would require, however, is a move towards accounts of science that take note of the plural and often contradictory roles of science in contemporary debates, and that recognize the complex entanglements that mark the history of science and continue to inform the ways in which science is invoked today. There is not, in our estimate, a ready set of approaches to these problems available at this point. To address this situation will involve forms of engagement with the roles of science and related knowledge practices, both historically and in our contemporary discourses, that move beyond merely reframing colonial cultural narratives of science, even while they recognize the ongoing impact of such narratives. Instead of a new master narrative of science, it will very likely prove more productive to give room to a plurality of angles that may, in aggregate, enable better ways of conceptualizing or operationalizing the polyvalence of science in a constitutively postcolonial modern world.

The Polyvalence of Science: 'Global Assemblage' and the 'Sign of Science'

Literary and cultural studies can make a significant contribution in this situation, we suggest, by promoting a differentiated and multi-perspectival engagement with the roles played by narratives, not simply in representing science but in promoting, legitimizing, and defining science. Engaging with the nexus between narrative and science means engaging both how science functions as a polyvalent signifier in literary, cultural, and public discourses and how narratives are used to produce and uphold cultural significations of science. In this context, we propose that it will be useful to distinguish at least three different meanings that the term 'science' can carry, each of which requires different forms of analysis and opens different spaces for intervention: science as a signifier of political and cultural authority; science as self-reflexive, open-ended process; and science as a complex, institutionally based, and institutionally regulated social practice.

To begin with, our engagement with previous critiques of the narrative of the 'spread of Western science' has focused on the use of science as a signifier of Western cultural and political authority (which is either bluntly rejected or rhetorically appropriated in its postcolonial reconfigurations). In the public debates surrounding these narratives and the conceptions of science they project, it is not specific scientific practices and institutions that are at stake, or the question of how these intersect with societal power structures, but a more reductive conception of science that claims to focus on science 'as such.' Gyan Prakash, already cited above, has called this rhetorical figure "the sign of science," by which he designates "science's cultural authority as the legitimating sign of rationality and progress" (1999, 7). Prakash elaborates:

As such science means not only what scientists did but also what science stood for, the dazzling range of meanings and functions it represented. The rich and pervasive influence of science was rooted in its ambiguity as a sign—its ability to spill beyond its definition as a body of methods, practices, and experimental knowledge produced in the laboratory and confined only to the understanding of nature. (1999, 7)

Prakash's analysis focuses on the role of science in the emergent independent Indian nation-state, but his observation about the role of "the sign of science" as a source of social authority and political legitimacy could easily extend to any modern state. Science continues to be taken as a barometer of civilizational advancement, a central component of the

grand narrative of modernity. In the context of a modern state, a policy that is mandated by science is without alternative; to be against science is to be irrational, gullible, backwards, counterfactual, superstitious, or fundamentalist. If we follow Michel Foucault's analysis of the modern liberal state, science becomes one of the crucial sources of biopolitical legitimacy: inasmuch as the modern state claims to exist to foster life, science provides the knowledge that understands what 'needs to be done' to protect and foster life (see Foucault 1978; Lemke 2011). Consequently, even actors that reject or deny specific pieces of scientific knowledge often do so by claiming the authority of science for themselves while 'mainstream' science is portrayed as corrupted by sinister conspiratorial forces (see, for instance, Garrard et al.'s insightful analysis of the rhetoric of climate change sceptics [2019, esp. 207–24]).

That the sign of science is used to legitimate public policy as imperative is especially ironic because 'science' can also mean the exact opposite of such compelling certainty. In an idealized self-conception of science, which appears to be paradoxically implied in the sign of science, the suspension of absolute certainty—or "organized skepticism"—is part of what Robert K. Merton identified as the "ethos of science" (Merton 1979). In this view, science does not 'reveal' or 'uncover' previously hidden truths so much as it establishes hypotheses supported by data; hypotheses which are, in the final analysis, always preliminary and, at least potentially, subject to revision and correction. In other words,

while many (or most) scientifically proven understandings about the world are solid enough to use as a basis for all kinds of acts of private and public decision-making, and most scientifically produced technologies are entirely safe to use both in everyday situations and in matters of life and death, they do not constitute anything other than a *moving consensus* among those scientists that are considered the most competent within a specific disciplinary field. (Hallonsten 2022, 294)

Of course, this is a normative ideal rather than a working description of actual scientific labour. Sociologists of science have pointed out that the work of actual scientists is guided by a much more complex web of norms and incentives—"organized skepticism," for instance, may often be countered by an "organized dogmatism," by which scientists are incentivized to defend theories and results that they have built their careers and professional reputations on (see Anderson et al. 2010).

Since the 1970s, the sociological and ethnographic study of science and scientific work in laboratories and other scientific settings has coalesced

into the field of science studies (see, for instance, Woolgar and Latour 1986; Latour 1987; Knorr Cetina 1999). For this approach, then, the term ‘science’ refers to a social practice conditioned by institutional constraints and economic incentives that condition what kind of research is funded, published, and rewarded with academic prestige and career advancement. These involve networks consisting of both human and non-human actors and revolve around processes of *construction*, *assembly*, and *negotiation*, rather than the *discovery* of scientific knowledge. This is not to say that scientific knowledge is arbitrary but, rather, that it emerges from a complex network of technical infrastructures and social interactions. Science studies also emphasized the impact that wider economic and political conditions, ideological frameworks, and cultural values have on research.

For a period peaking in the 1990s (the so-called ‘science wars’; see *Lingua Franca* 2000), the emphasis on these aspects gave rise to accusations of cultural relativism and naïve constructivism that, so critics argued, undercut the authority of science and made science studies—and the wider humanities as a whole—an unwitting patsy for corporate polluters and politically motivated anti-science populism. Arguably, the debate was animated by a superficial reading of poststructuralist discourse and a hyperbolic conception of its reach. In reaction to the charges levelled during the science wars, Bruno Latour, one of science and technology studies’ most prominent proponents, conceded that genuine critique should amount to more than mere deconstruction and should instead develop a panoramic view of the network of social and technological actors involved in the production of scientific knowledge (see Latour 2004). Moreover, recent upheavals within scientific disciplines—such as the replication crisis in psychology and various cases of scientific fraud—have led to a more open dialogue about the economic incentives and institutional context of scientific research within science itself. The rise of self-critical methodological reflection within science—known now as ‘metascience’—and the push for more transparent and participatory research practices under the banner of ‘open science’ since the 2010s would seem to suggest the emergence of a more productive interface between actors within science and critical observers in the humanities and in the wider public (see, for instance, Dijstelbloem et al. 2013, 2014; de Knecht et al. 2021).

When we come across the term ‘science,’ then, any one or any combination of these different significations—science as sign of authority, science as idealized process, or science as institutionally based and regulated practice—may be in operation. We do not mean to imply that every narrative of science can be neatly categorized along these three usages, nor that they are necessarily the only meanings of the term science. Indeed, we will often

find that different significations are entangled in cultural articulations, because the term science may have a plurality of functions within any given cultural setting. But it will be helpful to bear this polyvalence in mind as we come to examine different constructions and different modes of invoking science in the context of literary and cultural narratives.

An understanding of science in postcolonial contexts that corresponds productively to the heterogeneity of elements and functions of science in a globalized world has been suggested by Stephen Collier and Ahiwa Ong (2005). Their proposition of understanding science as a 'global assemblage' offers a perspective on the constitutive tensions in science between a definitional claim to universality, i.e. independence from cultural specificities, on the one hand and its invariable institutional and geopolitical positionality on the other. Collier and Ong define assemblages as "ensembles of heterogeneous elements" (Collier and Ong 2005, 5). In this perspective, the dimension of 'universality' in science is manifested as "an 'immutable mobile,'" a term which they adopt from Latour and gloss as "a technoscientific form that can be decontextualized and recontextualized, abstracted, transported, and reterritorialized, and is designed to produce functionally comparable results in disparate domains" (11). In practice, however, they note that this "immutable mobile" only exists within the context of particular assemblages; these are "products of multiple determinations that are not reducible to a single logic," and they should not be conceptualized as fixed and monolithic but, rather, as "emergent," appearing in "forms that are shifting, in formation, or at stake" (12). As Ong goes on to point out in a subsequent study, the concept of 'assemblage' "challenges the STS [i.e., Science and Technology Studies] theory of a universal science that floats beyond local mediations" (Ong 2016, xiii). The term 'global assemblage' therefore "suggests inherent tensions: global implies broadly encompassing, seamless, and mobile; assemblage implies heterogeneous, contingent, unstable, partial, and situated" (Collier and Ong 2005, 12).

While the concept of a 'global assemblage' offers a plausible account of the plurality, diversity, and sometimes disparity of the significations of 'science' across the range of its discursive and 'real-world' articulations, we will want to recognize, too, that this (or indeed any other) conception of 'science' is not likely to be universally adopted. In fact, in discursive practice, we are also likely to encounter the wide range of different conceptual options designated as 'science' that we have gestured towards earlier in this section. And the stories we tell about science are liable to feed back into how scientific research is being done and how it is publicly perceived in any given context.

Intersecting Science, Narrative, and the Postcolonial

A critical practice that engages with the polyvalence and heterogeneity of ‘science’ and the polyvalence and diversity of ‘narrative,’ based on a recognition of the constitutive postcoloniality of modern societies, can both draw on and contribute to a range of research fields, each of which approaches the intersection of science, culture, and postcolonial narratives from different directions. We specifically see four distinct critical traditions and their respective critical vocabularies that can gain by a more extensive reflection on the intersections between science, culture, narrative, and the postcolonial, namely: postcolonial literary and cultural studies, literature and science studies, postcolonial science and technology studies, and ecocriticism. As this section will briefly outline, literature and science studies has only very recently begun to address questions of coloniality and postcoloniality and to broaden its Western-centred canon of primary texts. Postcolonial literary and cultural studies, meanwhile, will benefit from more differentiated engagements with the polyvalence of science in its readings of postcolonial literary and cultural narratives. It may, in the process, gain opportunities for a more extensive, complex, and productive dialogue with postcolonial science and technology studies—a field which has, to date, not widely engaged with the relevance of the medium of narrative both for the cultural and critical perception and conceptualization of science. Finally, environmental criticism, as a field in which science has long held a position of epistemological authority, may obtain a greater reflexivity relating to the complexities of the significance of science for its critical practice. At any rate, our hope is that this volume will contribute to a dialogue between these traditions that can not only draw on their respective critical insights but also enrich the critical discourse in each of them.

As we have noted, *literature and science studies* has very recently begun to expand its traditional focus on looking at literature in connection with the science of its time and looking at science through the lens of the literature of its time. Drawing on antecedents such as Svendsen (1956) and Nicolson (1962), literature and science studies came into its own in the 1980s, especially around landmark studies by Gillian Beer (1983) and George Levine (1988), both preoccupied with the relationship between nineteenth-century English literature and the emergence of Darwinism. Beyond the impact of Darwin’s ideas on an explicitly thematic level, Beer and Levine stress common tropes and structures of thinking, a “mutuality of assumptions” (Levine 1988, 8) that link nineteenth-century literary and scientific writing. Rather than merely analysing the reception of scientific ideas in literature,

it has become a central tenet in literature and science studies that, at many points, “[t]he traffic [...] was two-way. Because of the shared discourse not only ideas but metaphors, myths, and narrative patterns could move rapidly and freely to and fro between scientists and non-scientists” (Beer 2000, 5). The field subsequently differentiated in two distinct clusters: a more theory-driven North American tradition, which often engages contemporary issues and texts, and a more historicist British tradition, which sought to place the traffic of ideas between science and literature in its specific historical context (Willis 2015, 3; Dawson 2006, 302).

While the intersections of narrative and science have thus formed a central concern in literature and science studies, the field has nevertheless been somewhat of a latecomer to the cultural turn. Both the British and the North American articulations of literature and science studies have maintained, well into the twenty-first century, a focus on Western narratives and ‘Western science.’ More recently, however, scholarship has begun to acknowledge the need to expand the canon of literature and science studies (see Gill 2018). Decolonizing literature and science studies thus not only entails a debate about what is studied but also how it is studied, and a genuine ‘decolonization’ of the field would have to go beyond a merely additive logic of including postcolonial texts. Literature and science studies stands to benefit from a stronger engagement with the conceptual tools of postcolonial criticism and theory, and the present volume thus seeks to make a contribution by encouraging a debate with postcolonial literary and cultural studies and working towards a postcolonial literature and science studies.

Postcolonial literary and cultural studies, in turn, stands to gain from a more extensive and reflexive engagement with the polyvalence of science in postcolonial contexts and, indeed, in contemporary criticism and theory. To the extent that the field has engaged the sciences, it has been predominantly focused on the connections between ‘Western science’ and the project of colonial and imperial expansion. Voices in the field have tended to position themselves in alignment with various forms of resistance to the claims for epistemic authority linked to the sciences—rather than exploring the polyvalence of science in postcolonial contexts.

A critical concern with the link between knowledge and imperial power goes back to foundational texts of postcolonial theory, such as Edward Said’s *Orientalism*, which underlined how entangled the academic study of colonized spaces was with colonial fantasies. The politics of knowledge has thus always been a core concern in postcolonial theory, foregrounding how the surveilling, cartographing, and categorizing of colonial spaces and peoples conditioned and enabled their material subjugation and

exploitation. A principal area where postcolonial criticism engaged with science, then, was the way in which science was used to establish racial identities and hierarchies (see, for instance, Gates 1985; Gilroy 1993; Young 1995). More than a merely rhetorical invocation of science, late nineteenth- and early twentieth-century race science “was widely accepted among the scientists of its times,” as Banu Subramaniam points out (2014, 4). The prominence and legitimacy of race science in its time highlights to what degree scientific thinking can be suffused with cultural preconceptions and stereotypes, despite its aspirations for universality and autonomy. It is thus not surprising that postcolonial literary and cultural studies has tended to position indigenous knowledge as a site of anti- and decolonial resistance.

By contrast, postcolonial studies has only far more recently begun to pay attention to science and technology as possible sites of appropriation and resistance. New interfaces have emerged between science and postcolonial literary and cultural production, and research on these has particularly focused on postcolonial science fiction, postcolonial speculative fiction, and Afrofuturist narratives. How ‘scientific’ science fiction actually is and whether the engagement with ‘actual’ science should be seen as a formative concern for the genre is an open debate within science fiction studies (see Bould 2012, 5–58). However, science and technology are central to the way in which the genre often re-stages and mythologizes the encounter between colonizer and colonized as antagonistic contest over who possesses the most powerful technologies. As John Rieder points out, “[t]he key element linking colonial ideology to science fiction’s fascination with new technology is the new technology’s scarcity. [...] [T]he relevance of colonialism to stories about technology shows up in the social relations that form around the technology’s uneven distribution” (Rieder 2008, 32). Postcolonial authors such as Nalo Hopkinson, Larissa Lai, and Nnedi Okorafor often displace this dynamic by playfully combining elements of science with African, Caribbean, and indigenous epistemologies (see Langer 2011, Kilgore 2014). As much as the genre responds to and rewrites the Western science fiction canon, postcolonial science fiction’s generic roots may be equally found in magical realism and, ultimately, indigenous storytelling traditions. As Jessica Langer argues, the presence of mythological or ‘magical’ elements in these texts “open[s] the genre of SF to new dialectical possibilities, and, more importantly, acknowledge[s] and foreground[s] the disparate worldviews of colonized, formerly colonized and diasporic peoples, for many of whom science and spirituality are intertwined and inseparable” (Langer 2011, 129). Thus, in the hands of these authors, the genre is less an extrapolation of what a future world

could ‘really’ look like and more of an epistemological laboratory in which the supremacy of Euro-American conceptions of science and knowledge can be challenged.

In extending its critical engagement with the polyvalence of science beyond the field of postcolonial science fiction, postcolonial literary and cultural studies can benefit from a dialogue with *postcolonial science and technology studies*. However, while postcolonial science and technology studies offers detailed analyses of the social and institutional dynamics of knowledge production in colonial and postcolonial contexts, the role of narrative in debates about culture and science has rarely been made a focus of research, with issues of representation and narrativization only occasionally coming to the forefront of sociological research. Sheila Jasanoff and Sang-Hyun Kim’s work on ‘technoscientific imaginaries’ stands out as a project that points in the direction of underlining the role of shared cultural imaginaries for shaping science and science policy (Jasanoff and Kim 2015). At the same time, more consistent engagement with literary and cultural studies might prove a fruitful direction for an interdisciplinary postcolonial studies that explores the significance of the intersections of literary, cultural, and science studies.

Indeed, a more determined critical reflection on the polyvalence of science in the context of *ecocriticism*, and specifically in postcolonial ecocritical debates and approaches, might align productively with the intersections of science and literary and cultural narratives. This is not only because many debates about science in postcolonial contexts involve an environmentalist component but also because environmental criticism has a long-standing special, but contradictory, relationship to science and scientific knowledge. The earliest articulations of ecocritical stances in the 1990s programmatically positioned themselves as an alternative to the perceived solipsism of postmodern literary criticism. The ecocritical focus on the cultural depiction of nature (a term that has only gradually come to be problematized) would seem to suggest a disciplinary proximity to the natural sciences, especially biology, ecology, and the environmental sciences. Inasmuch as ecocriticism regarded itself as an activist field that sought to mobilize literature and literary criticism to combat the ecological crisis, it drew on the natural sciences to define these problems (see Heise 1997, 2006). Given this, some ecocritics have suggested that the embrace of the natural sciences is almost a prerequisite for the field’s interdisciplinary practice (see Love 1999a, 1999b), if not a panacea for the humanities as a whole (see Gras 2010).

But ecocriticism also carried from the beginning a deep suspicion that science was the source of environmental problems, not only as the source

of specific technologies detrimental to the environment but also through an atomizing, objectifying worldview. For many ecocritics, then, redress for the environmental crisis lay not in specific ‘technofixes’ but in dismantling “conceptual dichotomies that modernity, the Enlightenment, and science were thought to have imposed on Western culture—the separation of subject and object, body and environment, nature and culture” (Heise 2006, 506–7). The increasing engagement of the field with postcolonial contexts and questions of environmental justice in the 2000s have expanded the understanding of environment to encompass “the places in which we live, work, play and worship” (Adamson, Evans, and Stein 2002, 4), thus further relativizing—but not entirely displacing—the centrality of the sciences for defining the problems that environmental critics are interested in. Explorations of the connection of colonial power and environmental destruction in postcolonial ecocriticism often touch upon the multiple, often contradictory, roles of science (see, for instance, Alaimo 2010; Nixon 2011), but there is no systematic exploration of how science is represented in postcolonial environmental discourse.

The discussion of the concept of the Anthropocene within the humanities in the 2010s, pioneered by esteemed postcolonial historian Dipesh Chakrabarty (2009), has not defused this tension. On the one hand, the concept undermined the problematic distinction between nature and culture, and the earth sciences and the social sciences and humanities would be forced to reckon with each other in order to understand the irreversible planetary impact of global modernity. Confronting the *longue durée* of the current environmental crisis also poses a question of aesthetics—what forms of narrative can move beyond the individualism and anthropocentrism that has characterized much of canonical modern literature (Ghosh 2016)? However, the term has also generated considerable pushback, especially from scholars in postcolonial ecocriticism because it “risks concealing—historically and in the present—unequal human impacts, unequal human agency, and unequal human vulnerabilities” (Nixon 2018, 8). Characteristically, while such critiques point out the universalizing and depoliticizing tendencies of a merely scientific discourse about the Anthropocene, they do not so much dismiss scientific findings as they selectively marshal them for critiques of capitalism and imperialism. Thus, the debate has included a plethora of alternative names (Capitalocene, as in Moore 2015, or Plantationocene, as in Haraway 2015) and alternatives starting dates for the Anthropocene (see, for instance, Lewis and Maslin 2015 or Malm 2016). But the central tenet that global modernity has inaugurated a distinct era in the history of the planet finds wide acceptance among these critics. Perhaps the most far-reaching critique of the debate comes

from Kathryn Yusoff, who calls out the apocalypticism of the Anthropocene discourse for obscuring colonial histories in which such apocalyptic harms have already been visited on indigenous communities (2018, xiii). Moreover, Yusoff identifies geology itself as an epistemological paradigm of colonial modernity, which, she argues, categorizes both minerals and black bodies as passive matter awaiting extraction by white subjects (3). Against the background outlined in this brief survey, the current debates around the Anthropocene and its namesakes, which affect and involve all four research fields we have invoked in this section, emerge as another area in which the critical reflection on the complexities of the intersections between science, narrative, and the postcolonial is called for.

Survey of Contributions

The contributions gathered in this volume approach the interface of science and culture in postcolonial narratives predominantly from a background in literary and cultural studies. More specifically, our contributors come from the backgrounds of both literature and science studies and postcolonial literary studies, often with pronounced interest in postcolonial ecocriticism; and all come together in engaging, from different angles and with different degrees of explicitness, with the questions raised by postcolonial science and technology studies. What their contributions share is a focus on the negotiation of these questions within specific primary texts so that, taken together, they demonstrate the thematic and aesthetic range opened up by literary narratives engaging with the interface of science and culture in postcolonial contexts. We have deliberately chosen to avoid pigeonholing the contributions according to their sub-disciplinary profiles, choosing instead to cluster contributions according to the ways that they conceptualize and engage with the functions of narratives, across a broad range of primary texts and thematic interests.

The initial section of this volume reveals a spectrum of perspectives on the potentials and functions of narrative for understanding the role of science in postcolonial contexts; but more than that, the contributions also reflect and problematize the role of narrative at the intersection of culture and the sciences. On the one hand, narrative, including autoethnographic observation, has the potential to foreground and interrogate established disciplinary practices and challenge the conceptual division between the (objective, rational, and disinterested) investigating subject and the (objectified and contingent) object of science. As such, narrative would not only serve as a representational tool but as a form of theory-making that

can make the entanglements of science and power and connections between science and other forms of knowledge visible. At the same time, the contributions in the first section show the specific situatedness of narratives and certain narrative practices (such as eco-narratives) as well as the ambiguities, limitations, and risks associated with too indiscriminate and de-problematized conceptions of narrative. In this context, the disciplinary expertise of literary criticism can be utilized to differentiate and assess the forms and effects of different narratives and types of narratives, pointing out both what they make visible but also what they may obscure, and displaying the tensions and complications that may attend the specific instances of narrative practice.

Josie Gill's programmatic contribution, "Black Literature and Science in the Age of Coronavirus," takes the conjunction of the COVID-19 pandemic and the 'Colston Must Fall' protests in Bristol as an entry point for interrogating the role of literature and science studies and the medical humanities in the context of what we have termed the constitutive postcoloniality of modern societies. Both the uneven exposure of Black and minority health workers in the UK during the COVID-19 crisis and the entanglement of institutions of higher education in the UK and beyond with the transatlantic slave trade speak to an unacknowledged legacy of racism within 'modern science.' These continuities, Gill argues, not only call for an expansion of the canon of texts that literature and science studies investigates but necessitate a different methodology. Drawing on Katherine McKittrick's *Dear Science and Other Stories* (2021), Gill proposes a Black literature and science studies that rejects the dichotomy between the data-driven, quantitative logic of science and the narrative-driven discourse of humanities scholarship. Gill highlights the importance of storytelling for an interdisciplinary methodology that is attendant to "interdisciplinary tales that might otherwise pass us by, stories in which we, through our institutions, cities and communities, are deeply embedded" (in this volume).

Graham Huggan's contribution, "What's a Colony? Scattered Speculations on Invasion Science, Eco-Narrative, and the Misuses of Alien Species," offers an incisive analysis of the modalities and functions of eco-narrative in an interdisciplinary dialogue with the field of invasion biology. The discourse surrounding invasive species is not only, as Huggan points out, a "perilous" transfer of cultural terms into the realm of biology: as his analysis of the discourse surrounding the European spruce bark beetle shows, invasion biology raises deeply problematic questions about who defines species as 'native' or 'foreign.' It also points to the limits of environmentalist storytelling as a template for interspecies empathy, as Huggan shows in an analysis of Germaine Greer's memoir *White Beech*. Greer's

attempt to restore a piece of southern Queensland rainforest creates a double bind: constituting the forest as a refuge for endangered “native” species requires her intervention, which is framed in explicitly colonialist terms: hotspots of native biodiversity have to be “defended,” races of indigenous plants have to be kept “pure.” The interspecies sympathy that provides the ethical animus of Greer’s text is thus, by necessity, limited to some species only. Huggan is careful not to frame this as a disqualifying aporia of Greer’s text but, rather, as a paradigmatic example of the challenges that eco-narrative faces when confronting the complexities of real-world ecological challenges. Nevertheless, Huggan insists on the possibility of a productive dialogue between the humanities and the sciences and retains an optimistic outlook for the possibility of working towards common languages.

A similar concern about the role of eco-narrative in contemporary debates informs Dominic O’Key’s contribution, “The Sixth Extinction and Postcolonial Literature: Dairy Production, Vulture Extinction, and Arundhati Roy’s *The Ministry of Utmost Happiness*.” The notion of a ‘sixth extinction’ posits that anthropogenic extinction has reached geo-historical levels on par, for instance, with the extinction of the dinosaurs. O’Key complicates this idea, highlighting the speculative dimensions of the conception without diminishing the seriousness of individual phenomena that are linked to it. O’Key’s essay itself is structured along a narrative framing that makes his own position as author visible, a strategy he borrows from ethnographic approaches to extinction studies developed by scholars such as Thom van Dooren and Deborah Bird Rose. However, O’Key also cautions that extinction studies’ conception of storytelling “risks uncritically privileging storytelling as a site of individual ethical development” and that “it leaves undertheorized the question of narrative itself as a fundamentally *literary* act.” O’Key demonstrates this with an insightful reading of the way in which Arundhati Roy’s *Ministry of Utmost Happiness* engages with the near-extinction of the white-backed vulture in India. Roy works the phenomenon—an unintended consequence of industrial dairy farming in India—into the novel’s opening passage. While this would position the novel as an act of witnessing in line with the ethical commitments of extinction studies, O’Key’s analysis also works out how ambivalent the novel is about the efficacy of storytelling as an ethical response. O’Key thus underlines a need to keep a differentiated and critical perspective on the different types and functions of narrative in the context of extinctions studies and of eco-narratives in general.

While the first section thus revolves around a problematization of the role of narrative in relation to science, the second section turns to narrative

representations of science in fiction and the way that texts engage with the geopolitical history and institutional reality of science in colonial and postcolonial contexts. The papers in this section build on the previous essays' concern with a multi-perspectival account of the potentials and limitations of narrative. All contributions, in their own way, are interested in how their primary texts undercut the seeming uniformity and cultural authority of 'the sign of science'—by introducing a historical perspective or through an ethnographic description of the institutional practice of science and the way that its global structures and universalist aspirations intersect with local structures of power. Despite the range of material, including both Western and postcolonial authors as well as contemporary and historical material, all of them taken together point the way to what an emerging field of postcolonial literature and science studies may look like.

Opening the section, Wolfgang Funk's contribution, "'They Were All Blondes': Intersections of Racism, Feminism and Eugenics in Mary Bradley Lane's *Mizora*," introduces an important historical perspective on the function of speculative texts as epistemological laboratories. Lane's 1880 novel depicts an all-female utopia hidden within a hollow Earth, populated by blond "Aryans" who reproduce through parthenogenesis. Like Charlotte Perkins Gilman's more famous *Herland* (1915), *Mizora* belongs to a tradition of eugenicist thinking in late nineteenth- and early twentieth-century feminism whose progressive politics on gender and class seem difficult to square with its racist implications. *Mizora*, *Herland*, and eugenic feminism in general demonstrate how the emancipatory potential of science in Western societies could be simultaneously entangled with an imperial politics of race; the novel thus questions the dichotomy of viewing science either as the instrument of repression or as an inherently progressive, emancipatory force. While *Mizora* seems to suggest the desirability of its all-blond society by invoking the narrative template of the utopian novel, Funk demonstrates that the novel's ambiguous ending opens a critical perspective on the politics of eugenic purity that is missing from its more famous spiritual successor *Herland*.

Anton Kirchhofer's essay, "Beyond the Cultural Stereotyping of Science: Michael Ondaatje's *Anil's Ghost* and the Postcolonial Science Novel," explores the contribution which postcolonial fiction may make to critiquing, shaping, and revising the cultural narratives about science and related knowledge practices in diverse geopolitical settings. It shows how postcolonial fiction can take the narrative representation of science and related knowledge practices beyond the cultural stereotyping whose formative influence has by no means been completely superseded in popular perceptions and even critical accounts of the cultural place of science.

Set against the background of a spectrum of Anglo-American and South Asian ‘science novels,’ and drawing on Ong’s concepts of ‘science as global assemblage’ and ‘Euro-American cosmopolitan science,’ the essay offers a detailed reading of science and related knowledge practices in Michael Ondaatje’s *Anil’s Ghost*. The essay specifically highlights three related textual strategies that inform the dynamics of plot, character constellations, and narration and make *Anil’s Ghost* stand out among postcolonial science novels: the detail and intensity with which the novel works to establish and profile an alternative, culturally and geopolitically sensitive, perspective on science.

Karsten Levihn-Kutzler’s contribution, “Entangled Modernities and Locations of Knowledge in Amitav Ghosh’s Science Novels,” finds similar dynamics in his reading of Amitav Ghosh’s novels *The Hungry Tide* and *The Calcutta Chromosome*. Both initially seem to suggest an encounter between science and other, indigenous, knowledge systems in rather straightforward, if not antagonistic terms only to then subvert stereotypical constructions of ‘native informants’ and simplistic assumptions about ‘indigenous knowledge.’ In *The Hungry Tide*, a Western-trained marine biologist relies on the local knowledge of an illiterate fisherman who, it turns out, is not a font of traditional local knowledge but a patient, scientifically precise observer. In *The Calcutta Chromosome*, a cult-like conspiracy is secretly manipulating colonial medical research to their ends, but rather than being stalwarts of some ancient occult knowledge, these “counter-scientists” are a thoroughly modern force working within and through modern science and technology. Both novels, however, seem to struggle with the question of how such knowledge practices can be articulated within the form of the anglophone novel. In *The Hungry Tide*, the native informant’s knowledge is ultimately assimilated by the global science system, while in *The Calcutta Chromosome*, the counter-scientists remain outside the system as a menacing, but silent, spectre.

Fabian Hempel and Krutika Patri’s contribution, “Resentment from Below: Manu Joseph’s *Serious Men* as a Subaltern Prism on Indian Modernity,” represents a genuinely interdisciplinary endeavour at the interface of literary studies and sociology. Joseph’s novel portrays how different actors within an elite Indian research institute jockey for position, including a Dalit assistant, who tries to place his son in the institute, and a female researcher struggling against her colleagues’ entrenched sexism. Hempel and Patri leverage Joseph’s novel to explore how gender inequalities and caste hierarchies persist within institutionalized science in contemporary India, despite science’s professed egalitarian ethos and official efforts to promote scheduled castes. Perhaps counterintuitively, the novel’s satirical

edge helps the authors in this sociological reading because the exaggerated characterization of individual actors positions them as paradigmatic stand-ins for larger ideological and institutional forces within the Indian science system. The purported autonomy and meritocracy of scientific institutions, the novel suggests, provides a cover for persistent racist, casteist, and sexist structures of exclusion. The novel's marginalized subjects can gain or maintain access to the institutional spaces of Indian science only by leveraging its internal rivalries, thus exploiting the system without ultimately questioning its exclusionary structures.

In her contribution, “‘Our Doing and Undoing’: Anthropological Encounters and the Cultural Limits of Narrative in Lily King’s *Euphoria*,” Anna Auguscik explores the use of literary narrative for a critical engagement with the disciplinary history of ethnography. King’s novel explores the professional and romantic dynamics between fictionalized versions of the historical anthropologists Margaret Mead, Reo Fortune, and Gregory Bateson whilst in the field in New Guinea, a pivotal moment in the development of the discipline from an objectivist colonial science towards a more interpretative, dialogic practice. The novel makes clear that the ethnographic encounter remains one-sided and potentially exploitative nonetheless and highlights how ethnographic research can be used against its subjects by imperial power. Yet the novel itself remains ultimately one-sided, too; its gaze is directed inwards, with the romantic and psychological foibles of the central *ménage à trois* taking centre stage; moments of irritation in which indigenous people gaze back at the protagonists are quickly streamlined back into a romance plot presumably more attractive in a global commercial book market.

While the novels analysed in the second section might all be said to have an analytical angle on the role of science in colonial and postcolonial cultures, the narratives that the contributions in the third and final section of this volume engage with are more exploratory in nature. The novels under scrutiny in Part 2 deal with science in specific institutional or historical settings that allow for the possibility of an analytical perspective from the outside looking in. The texts considered in the following contributions, however, portray worlds so completely suffused with science that there is no outside that offers a stable vantage point of critique. In other words, whereas the previous section highlighted that there is no science outside culture, the following section explores what it means when there is no culture outside science. The vexed position of science in postcolonial societies makes this ubiquity an extremely ambivalent prospect: on the one hand, these texts depict bodies and environments permanently transfigured by colonial and neocolonial technologies; on the other hand,

science and technology also offer the potential for appropriation and resistance. A preponderance of the contributions in the following section deals with speculative scenarios, but some address issues that are very much present-day realities, such as climate change or global commercialized surrogacy. Yet even where these texts speak to past or present realities, they engage with scenarios that undermine fundamental tenets of the modern novel, such as the integrity of the human self and the distinction between self and environment or between a natural and a human-made sphere; thus, all of them are, in one way or another, exploring how new kinds of narrative can help us understand a post-natural and post-human world.

Kanak Yadav's contribution, "Writing the 'Terrestrial': Shubhangi Swarup's *Latitudes of Longing* and the Postcolonial Environment," draws on Amitav Ghosh's assertion that the conventional realist novel is unable to address climate change and the Anthropocene due to its focus on individual human agency and localized setting. By contrast, *Latitudes of Longing* connects stories across vast distances, programmatically disregarding political borders and focusing instead on geological ones: its four constituent parts, which are set on the Andaman Islands and in Myanmar, Nepal, and Kashmir, respectively, are connected by the margin of the Indian tectonic plate. The novel intertwines the fate of its human characters with geological forces and non-human entities, which Yadav describes with Bruno Latour's notion of the terrestrial. However, while the novel uses geological knowledge as its structuring principle, it also draws out the limitations of Western geological knowledge by depicting 'nature' not as an inanimate environment but as a set of active forces that the novel's protagonists have to confront and that is best comprehended through other forms and sites of knowledge. The novel thus employs narrative techniques and specific character constellations in order to juxtapose different orders of knowledge and to reposition these within a reconceptualized relationship of humans and the non-human environment.

In their contribution, "Scientists and Their Discoveries: A Postcolonial Reading of Ted Chiang's Science Fiction," Victoria Herche and David Kern demonstrate how Chiang refracts the colonialist implications of science fiction's genre tropes. Science fiction's traditional rhetoric of scientific 'progress,' 'discovery,' and new 'frontiers,' they argue, betrays a "colonial, Eurocentric fantasy of advancement, progress, development, and imperial appropriation." Herche and Kern demonstrate how Chiang's short stories "Exhalation" and "Story of Your Life" fold this rhetoric of historical and spatial advancement in on itself: in "Exhalation," it is not a new frontier in a munificent, exploitable universe that is discovered; instead, the protagonist comes to understand that they live in a finite universe in which

every action, including the protagonists' own scientific pursuits, bring the universe closer to a final, entropic equilibrium. The only object worth investigating in this context seems to be the protagonist itself, so that science becomes a "solipsistic periscope." "Story of Your Life," meanwhile, reworks the colonial trope of the first-contact narrative. Normally conceived as an antagonistic confrontation of an "advanced" and a "primitive" culture (see Rieder 2008, 5–6), Chiang's contact narrative abrogates the notion of historical progression itself. "Against the linearity of discovery," Herche and Kern conclude, Chiang's stories "privilege circularity and illuminate the inescapability of subjectivity at the heart of scientific inquiry."


Alessandra Boller's contribution, "'I'm a Patented New Fucking Life Form': Scientific Knowledge-Making Practices and Practices of Knowing in Larissa Lai's Utopian Fiction," also traces the juxtaposition of different forms of knowing in speculative texts. Looking at Lai's novels *The Tiger Flu* (2018) and *Salt Fish Girl* (2002), Boller shows how Lai juxtaposes the abstract, objectifying production of knowledge and embodied practices of knowing. The former lends the texts a distinctly dystopian quality, as scientific practice is used for biocolonialist and biocapitalist projects that commodify the human body and mind; the latter offers utopian possibilities by imagining communal forms of knowledge production and dissemination and alternative forms of reproduction outside of patriarchal and biocapitalist control.


Christina Slopek-Hauff's contribution, "Specious Species Taxonomies: Porosity and Interspecies Constellations in Nalo Hopkinson's *Midnight Robber*," explores the uses of postcolonial science fiction—especially Afro-futurist narrative—to renegotiate black subjectivity beyond the dichotomy of human and non-human. This might seem a counterintuitive interest at a time when global debates about decolonization and institutional racism have foregrounded the struggle of black and indigenous people to claim equal humanity, i.e. recognition as full legal and political subjects. But as Kathryn Yusoff has recently argued, "the inhuman" is not an antonym of the human, nor its historical antecedent; the non-human is a "subcategory" of the human and "historically relational to a discourse of settler-colonial rights and the material practices of extraction" (2018, 2). Speculative narrative thus provides a space in which Black people do not need to be rescued from a state of primordial rightlessness by the march of progress, only to be opposed to an inanimate, exploitable environment. Instead, the intimate connections with technological entities and non-human species portrayed in *Midnight Robber* suggest a taxonomic porosity in which the distinction between human subjecthood and non-human environment is blurred. Hopkinson's protagonist is initiated into this 'porous' multispecies

community through a process reminiscent of the Bildungsroman, a generic tradition whose anthropocentric, individualist connotation may ultimately undermine the novel's emancipatory stance: the novel ends, as Slopek-Hauff points out, with the reconstitution of a human nuclear family.

Rounding off the volume, Julia Wurr's contribution, "Reproducing Inequality: Commercial Surrogacy in Joanne Ramos' *The Farm*," returns us once more to the question of 'unnatural' reproduction as an intersection of science with hierarchies of race and class. Ramos portrays a just-around-the-corner society in which female reproductive capacities are commercialized through surrogacy, stratified according to racist criteria, and intensely monitored through the application of medical technology. Surrogacy thus takes on a distinctively dystopian guise in *The Farm*, which Ramos contrasts with evocations of 'natural' motherhood. Wurr rightly calls out this simplistic dichotomy, but precisely because the novel paints the opposition of 'natural' and 'unnatural' forms of reproduction with such broad brushstrokes, it can help to better understand the blind spots of wider debates about surrogacy and the exploitation of racialized women's bodies within a commodified global surrogacy industry. Despite the novel's speculative setting, it ultimately cannot look beyond the limitations of these debates, Wurr argues, because it remains entangled in what she calls, with Mark Fischer, "capitalist realism." Within the ideological conventions of a globalized economy, any non-commercialized, oppositional, or emancipatory use of reproductive technology is unthinkable. Like the protagonists in Manu Joseph's *Serious Men*, Ramos' characters must acquiesce to exploitative structures of power that determine who has access to scientific knowledge and the ability to utilize it to their advantage.

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POSITIONING NARRATIVE

Black Literature and Science in the Age of COVID-19

ABSTRACT Racism in Britain is a public health issue. The health of Black and minority ethnic Britons is shaped by structural discrimination and inequality, leading to illness and, in many cases, death. The Windrush scandal saw the withdrawal of NHS services from those wrongly labelled as non-citizens as well as high levels of stress and anxiety caused by the loss of jobs, homes, benefits, and wrongful deportation. The COVID-19 pandemic has also had a disproportionate impact on Black Britons, who have been found to be four times more likely to die of COVID-19 than white people. How do we do literature and science studies, or medical humanities scholarship, in this context? How do we read, imagine, intervene in, and understand the way that hostile environments and spaces—the street, the hospital, the university—shape the experience of Black Britons in ways which science and medicine are unable or unwilling to capture? Who is the ‘we’ I am referring to here, and who is ‘our’ audience for this work? In this essay, I explore some possible responses to these questions, in dialogue with Katherine McKittrick’s *Dear Science and Other Stories* (2021) and with the work of other Black thinkers and writers which asks us to carefully attend to our methodological responses to racism across disciplines.

KEYWORDS Bristol, interdisciplinarity, literature, race, science

1

In May 2020, the organizers of the Science, Culture, and Postcolonial Narratives conference wrote to me to ask for a title for the keynote address I had agreed to give at this conference. This was three months into the unprecedented UK lockdown, and by this time a particularly disturbing aspect of the pandemic in the UK was becoming more widely known. On 25 May 2020, *The Guardian* reported that six in ten UK health workers killed

by COVID-19 were from Black and minority ethnic backgrounds—a figure highly disproportionate to the percentage of NHS staff who are BAME (Marsh and McIntyre 2020). The British Medical Association has since reported that during the first wave of the pandemic in 2020, 95 percent of doctors who died of COVID-19 were from a BAME background (out of a workforce where 44 percent are BAME) (Cooper 2020). Not only were BAME health professionals dying at a disproportionate rate but this trend also applied to the population as a whole: in May 2020, the Office for National Statistics released figures which showed that Black people in England and Wales were more than four times more likely to die from COVID-19 than white people. I had been thinking about the effects of racism on health for some time before the pandemic, but now experiences of this were in the daily news. While there were concerted attempts to frame the disproportionate impact on BAME people as caused by biological (indeed, racial) difference, such rhetoric was challenged and debunked: for example, the BMA reported that BAME doctors were disproportionately affected by shortages of personal protective equipment (PPE) and experienced higher rates of pressure than white colleagues to work in settings with inadequate PPE (Cooper 2020). The pandemic exposed and brought into public view long-standing patterns of inequality in health between white and non-white populations in the UK, revealing that these inequalities are structural (not genetic) and that little has been done, at a political level, to address them.¹ In fact, the conservative government’s “hostile environment” policy, introduced in 2012 to reduce the number of what they called “illegal immigrants,” only exacerbated racial health inequalities. The wrongful labelling as illegal of many Black Britons who had come to the UK from the Caribbean as children led to these citizens being deported, losing jobs and housing, and being denied medical treatment because suddenly they did not have the required paperwork. In the case of Sylvester Marshall, this resulted in him being denied radiotherapy cancer treatment by the NHS because he could not prove that he was in the UK legally.² Many others suffered stress and other health conditions as a result of their treatment, and many Black Britons and former Commonwealth citizens caught up

1 In 2021, the British government’s Commission on Race and Ethnic Disparities published a report in response to the Black Lives Matter movement, which concluded that it was Black and minority ethnic people’s perception and mistrust of public health services that was the cause of health disparities, rather than racism within institutions (Sewell 2021).

2 He went on to receive treatment and recovered after his case was highlighted by a *Guardian* newspaper investigation in 2018 (Gentleman 2018).

in the “Windrush Scandal” have since died in their 50s and 60s, before receiving compensation from the government (Gentleman 2021).

It was in this context that I gave the title “Black Literature and Science in the Age of COVID-19” to the conference organizers. I was looking for a way to address what was going on and to think through how it connected to my own ongoing work on the interfaces between literature, literary studies, science, and medicine and questions of race, racism, and racial justice. By then, news of George Floyd’s murder was being reported around the world, and within a matter of weeks, the Colston Statue in Bristol was torn down during a Black Lives Matter demonstration. As the director of the Centre for Black Humanities at the University of Bristol during this time, I plunged into organizing and coordinating many academics and students who wanted to see the change being demanded in the city replicated on campus: the University of Bristol has many connections to historic wealthy families linked to enslaved labour, three of whom, including Colston, were (until 2024) represented on the university crest. Staff and students were demanding that the university not only address its past in a more robust and open manner but that it address contemporary racial inequalities within its walls: racism on campus and the lack of Black people in academic positions, to name only two. For two weeks or more, I was consumed by composing and coordinating open letters and emails to management. I had been used to doing this kind of academic activism throughout my time at Bristol, and my experiences have fed into my keen sense that when I write about literary studies, or more specifically about literature and science studies, I cannot separate the theoretical from the practical; that methodology is not simply developed from engagement with theoretical writing and academic debates in journals, but that it is intimately connected with the everyday conditions in which I work and the wider structural inequalities to which these conditions are linked. As I lived through these events of May 2020 and in the months afterward, it became increasingly clear to me that my talk needed to address how the events of 2020—the COVID-19 pandemic, the Black Lives Matter movement, and the wider movement to ‘decolonize’ universities which gained significant traction from these events—were connected to the fields of study, in particular literature and science studies, with which I have engaged thus far in my career. How can this field address racial injustices and inequalities, and what would it mean for it to do so? And how are the events of 2020 (and the conditions which created them) linked to the relationship between the sciences and the humanities?

In what follows, I attempt to think through these questions and to suggest some (partial, incomplete, and speculative) answers that I hope will

provoke discussion around the methodological norms and established literary critical conventions of literature and science studies in the UK. I begin with a brief overview of how discussions of race, the postcolonial, or the decolonial have been largely absent within the field—a situation recognized in the editors’ introduction to this volume, which states of the relationship between science and postcolonial studies that “the cultural imagination of this connection has rarely been made a focus of research” (this volume). Noting the limitations of models of inclusion—where the solution to this absence is simply to ‘include’ authors, academics, or voices of colour rather than to interrogate the disciplinary mores which omitted them in the first place—I suggest that, instead, the field needs to take seriously the demands of the decolonization movement, in which racial justice cannot be achieved without a thoroughgoing change in knowledge production and recognition of the continuing relationship between disciplinary methods and institutional, social, and political power. Inspired by the provocations of Katherine McKittrick’s *Dear Science and Other Stories* (2021), I attempt an undisciplined reading of literature, science, and institutions in Bristol as a way of rethinking the relationship between creativity, academic disciplines, and location and the stories that together these tell when it comes to comprehending Black life. Drawing on the events of 2020 and two Black Bristolian artistic responses to them, I explore how McKittrick’s work helps us to reorient questions of knowledge and value which recur in debates about the relations between the sciences and the humanities.

2

In a recently published essay, Michael Whitworth defines the field of literature and science studies thus:

The historicist study of the relations of literature and science is a critical practice that draws eclectically on a range of linguistic, literary, and cultural theory, and which has also been significantly informed by concepts and practices in the fields of history and philosophy of science, science and technology studies, and the sociology of scientific knowledge. These bodies of theory have crucially enabled it to overcome deeply ingrained cultural assumptions about the relative statuses of literary and scientific forms of knowledge, but its focus on historical frameworks and contingencies means that practitioners have not always fully articulated their working premises, preferring in many cases to build on the practices of their predecessors. As a field, it has been open to theory but ambivalent about theorization.

Moreover, it exhibits significant internal divisions regarding methodology. In part these correspond to the periods under study, but there are also significant methodological divergences associated with North America and the United Kingdom. North American practice [...] takes a greater interest in contemporary culture, including developments such as posthumanism, visual cultures, digital humanities, programming languages, and video games; it is less interested than its British counterpart in historical literature and culture, as well as in the ways that the incorporation of science into a specifically literary discourse may transform it or call into question its authority. (Whitworth 2020, 2)

Whitworth's accurate description captures the heterogeneity of a field concerned with multiple kinds of intersections between the literary and the scientific. Literature and science studies, a field with a long and substantial history, covers a range of historical periods, critical approaches, and concerns and, in the UK tradition, has been characterized by negotiations of the relationship between the disciplines "found not in the conceptual apparatus of any particular body of theory, but in the critical writing itself at the level of the sentence, the paragraph, and above" (Whitworth 2020, 12). Whitworth's summary essay makes no mention of postcolonial studies, critical race studies, or ethnic studies in its analysis of the different fields and disciplines which have influenced the study of literature and science in the UK, and in this it also accurately reflects the state of the field. These absences are, perhaps, unsurprising given the mode of influence and field building Whitworth identifies as dominant in the UK; building carefully on the practices of predecessors is clearly not a methodology that might readily admit new or radical approaches from other fields or traditions. While Whitworth encourages us "to recognize the critical concepts that are implicit in apparently untheorized moves and that are embodied in the writing, though never explicitly named" (13) as a positive and productive tradition of the field, this mode may also account for the field's lack of engagement with the highly theorized issues of race, racism, and social justice.

That literature and science studies in the UK and Europe has overlooked questions of race, the postcolonial, or the decolonial is evident from a cursory glance at edited collections of essays published in the field within the last 15 years or so. The *Routledge Companion to Literature and Science*, published in 2011, includes a section on different sciences, a section on "disciplinary and theoretical approaches" such as "deconstruction," "feminist science studies," and "posthumanism," and a section on periods and cultures, but has no chapters on postcolonial studies or race (Clarke and Rossini 2011). The *Cambridge Companion to Literature and Science* (2018) has

no chapter on postcolonial studies, critical race studies, or Black studies in its theory section, and a search of the book returns nothing for the word ‘postcolonial’ (while ‘race’ appears a few times). Another volume, *Literature and Science* (2008), opens with a discussion of controversial novelist V.S. Naipaul’s comments on English departments (he suggested that they should be closed down and that only science should be taught in universities) (Ruston 2008). While giving the editor an opportunity to describe continuing debates which pit science against the humanities, and to discuss what is described as the amorphous and difficult-to-define discipline of English, there is no consideration of postcolonial or critical race approaches in English or of writers of colour in relation to science.³ So concerned are these books with addressing the science and humanities divide that they often fall back on a conception of the humanities, or indeed of literature, in which the work of writers of colour or postcolonial writers is notably absent. Instead, they more often make use of the ‘classics’ of British and European literature, references to which pepper their introductions and overviews.

There is evidence that things are starting to change. The introduction to *The Palgrave Handbook of Twentieth and Twenty-first Century Literature and Science*, which was published in 2020 and contains chapters about and by a range of Black and minority ethnic writers and thinkers, states that “the emerging field of literature and science coincided with the increasing attention to problems of social inequality, power, and violence” and that “[a]nalyse[s] of how literature might inform a more socially just science, as well as how science frames discourses and material practices relating to colonialism, race, sex, labor, and state formation, are at the heart of the field of literature and science” (Ahuja et al. 2020, 5–6).⁴ These statements about the field perhaps reflect more of a North American context than they do a European one, and the differences between fields in the UK and the US were addressed in two special issues in 2017 and 2018 on the “State of the Unions” in the UK-based *Journal of Literature and Science* and in the US-based *Configurations*. The first issue noted “the lack of attention to postcolonial critique within literature and science” and how “this is

3 While it is acknowledged that “this volume could never have represented all of the historical periods of literature or science; neither the many genres of literature nor subjects of science; and not the multitude of possible methodologies that might be used in considering the relationship between the two” (Ruston 2008, 7), the absence of these topics and concerns is still noticeable.

4 The *Routledge Research Companion to Nineteenth-Century British Literature and Science* (Abingdon: Routledge, 2017) also contains chapters on science and empire in its “Contexts” section.

indicative of wider concerns about what the field has concurred is central and consequently what is marginal” (Littlefield and Willis 2017, 3). The second noted that

[r]acism, gender equality, and gun violence, articulated most dramatically by Black Lives Matter, #MeToo, and the multiple marches and protests that students have staged against mass shootings in schools, are now an everyday reality in our communities and in the news. Presumptuous though it may seem to relate these grand developments back to our corner of the humanities, their knock-on effects on higher education will be considerable (Sudan and Tattersdill 2018, 255–56).

A similar trajectory can be seen in the medical humanities, which, in undergoing a critical turn, has also seen calls for a focus on literature and perspectives beyond the Western canon and on questions of race.⁵

But calls are not action, and it remains to be seen what attention to the postcolonial, or an engagement with racism, might look like in these fields beyond the rather straightforward inclusion of the works of writers or academics of colour—an increasingly standard (and long-standing) response across the academy to ‘problems’ related to diversity. In their introduction to the “State of the Unions” special issue in the *Journal of Literature and Science*, Martin Willis and Melissa Littlefield consider what has been marginal in literature and science studies and what is now entering the field (which includes the topics of literature and technology, science fiction, and postcolonial critique) and suggest that

[e]ither the field of Literature and Science will begin to break-up into smaller derivations as it evolves, or it will begin to accrue other territories. It is perhaps more likely that the latter is the field’s immediate future and that it is already (and perhaps for the first time here articulated) in the early stages of accrual (2017, 3).

The suggestion here is that other genres, subjects, or theories such as ‘the postcolonial’ will become incorporated into the field; the financial language of “accrual” implies that the field will benefit from the addition

5 See, for example, Sarah Atkinson, Bethan Evans, Angela Woods, and Robin Kearns, “‘The Medical’ and ‘Health’ in a Critical Medical Humanities,” in which the authors argue that the medical humanities has a role in “looking beyond the classics of the Western canon to engage with forms of creative practice that may unsettle and disrupt the ways in which particular bodies and subjects are defined as healthy or not” (Atkinson et al. 2015, 77).

of what was previously marginal. Yet how what has been central—often the canonical—will be affected or impacted by this incorporation of another ‘territory’ is uncertain. Writing on ‘the canon’ in 1989, the Black feminist literary scholar Hazel Carby argued that, while an expansion beyond the English literary canon to include texts written by Black authors and writers of colour is important, “[w]e should not be satisfied [...] with our mere inclusion in the academy. My Caribbean course, for example, should be part of the process of redefining Englishness that is implied in the structural organization of English departments” (Carby 1999, 241). Carby critiques tokenistic approaches where “the politically correct thing to do is to make sure that your collection of essays, or your conference, includes the obligatory black perspective” (238) and argues instead for these perspectives to provoke a redefinition of the study of English as a means of addressing “the deeper problem,” which is “the ways in which our society is structured in dominance” (238). Addition or inclusion are simply not enough—the challenge of the ‘marginal’ is a challenge to the structure, organization, and methodology of the whole.

Carby’s words evidence the long history of demands for institutional change that are now most prominently articulated under the banner of the movement to decolonize universities. This worldwide student-led movement is characterized by calls for an acknowledgement of how current systems of knowledge have been shaped by colonialism, for consequent changes to the shape of the curriculum, and for universities to address their own colonial entanglements as well as the experiences of Black and minority ethnic students. Much has been written about this widespread movement, which is difficult to summarize here; but the essence of the movement, as I understand it, is focused on consciously linking research, teaching, institutional cultures, and lived experience to the continuing reverberations of colonization; as Nelson Maldonado-Torres puts it, “Decolonial movements tend to approach ideas and change in a way that do not isolate knowledge from action. They combine knowledge, practice, and creative expressions, among other areas in their efforts to change the world” (2016, 7). It is perhaps because of the movement’s emphasis on action and change, rather than simply theorizing and discussion, that it has received substantial criticism from both within and outside the academy, to the degree that, as Robbie Shilliam contends, “criticism of the decolonizing project has gained more traction than the project itself” (2018, 59). While, as Achille Mbembe notes, “Calls to ‘decolonize’ are not new” (2021, 56), these calls still have the ability to “generate anxiety and fear”—something Maldonado-Torres names as his first thesis on coloniality and decoloniality:

Addressing colonialism and decolonization as anything more than past episodes or events raises anxieties and fears: anxieties about the legitimacy of the normative citizen-subject and the social, political, and economic order that sustains it, and fears about the very presence and the potential action of those who typically address these topics in this way—that is, the colonized. These kinds of anxiety and fear lead to multiple forms of evasion, to micro-aggressions, and to open aggressive behavior. Anyone who introduces the question about the meaning and significance of colonialism and decolonization most likely faces a decadent and genocidal modern/colonial attitude of indifference, obfuscation, constant evasion, and aggression, typically in the guise of neutral and rational assessments, postracialism, and well-intentioned liberal values. Education, including academic scholarship, national culture, and the media are three areas where this modern/colonial attitude tends to take hold and reproduce itself. (Maldonado-Torres 2016, 8)

Faced with calls to examine and critique “subject, object, and method,” which are “key terms in the modern/colonial conception of knowledge” (Maldonado-Torres 2016, 18), those maintaining the status quo feel threatened and attempt to further undermine their questioners as “irrational” or lacking objectivity through “bad faith responses” which “are already inscribed in disciplines, methods, and texts” (9). While academics often construct reasons for agreeing with the principles of the struggle but not with the practices of advancing it (7), politicians in the UK have called decolonization “censoring history” and “negative” (Stubley 2021). While, as Maldonado-Torres (2016) acknowledges, student movements are not perfect (6), and as Mbembe notes, “we still do not have a precise idea of what a ‘truly decolonized knowledge’ might look like” (2021, 56), the problems in the project, such as the way “decolonization is easily reduced to a matter of origins and identity, race and location” do “not constitute sufficient grounds for an outright repudiation of the decolonizing project. After all, the uncompromising critique of the dominant Eurocentric academic mode—the fight against what Latin American critics call ‘epistemic coloniality,’ that is, the endless production of theories that are based on European traditions—is still necessary” (7).

Why should these developments and debates be of especial interest to scholars of literature and science? For one, as I have argued elsewhere, there are significant commonalities between the interests of literature and science scholars and scholars concerned with decolonization: both are concerned with the critical role that disciplinary classification plays in shaping knowledge, with the constitution of and relationships between disciplines and methods, and in how some knowledge is variously ordered

and valued in relation to other forms of knowledge (Gill 2018, 283–88). Literature and science scholarship has often used as its starting point (the history of) debates about the relative value of the humanities as compared to the sciences; as Martin Willis argues, “there are two key moments which have continued to influence the field in its present state. The first was the two cultures debate between C. P. Snow and F. R. Leavis in the late 1950s and early 1960s, while the second was the science wars, initiated by Alan Sokal in 1996” (2015, 2). While much work in the field since has been focused on points of commonality, intersection, reciprocity, and ‘two-way traffic’ between the literary and the scientific (rather than the “mutual incomprehension” which Snow argued characterized the relationship), it has nevertheless been the case that much contemporary scholarship is often focused (even if implicitly) on asserting literary value—that literature can illuminate (the production of) scientific knowledge, fact, principle, or practice—against a backdrop of “charged rhetoric around science and the humanities” including “the continued rhetorical pitting of STEM against the humanities as a justification for differential funding” and “the increased application of the scientific lab model to the infrastructure of the humanities” (Ahuja et al. 2020, 9–10).⁶ In recent years, humanities scholars have found themselves needing to defend the humanities against the encroachment of scientific principles and methods of measurement that are sometimes put forward by university management or, indeed, by scientists themselves as a way of breaching the so-called science–humanities divide. Thus, just as interdisciplinarity, collaboration, and mutual influence are emphasized by scholars, there is also an acute awareness of the need to assert the value and utility of humanities methods as distinct from those in the sciences.

Scholars of decolonization also understand there to be commonality and reciprocity across disciplines but in a way which is, perhaps, less positive and which is less interested in the relative status of the humanities in relation to the sciences than in how all established disciplines’ methods and norms contribute to the kind of unequal valuing of different kinds of knowledge which would otherwise excise literature and science scholars. The decolonization movement understands the different disciplines of the academy to be much more aligned to one another, taking as its object of analysis ‘the university’ as a whole, where the division of knowledge is not

6 In 2020, the British Academy and UKRI introduced the acronym SHAPE, standing for Social Science, Humanities, and the Arts for People and the Economy, to act as an equivalent to the well-known acronym STEM (standing for Science, Technology, Engineering, and Mathematics) which is seen to positively attract more students to those subjects.

between the sciences and the humanities but between academic knowers and knowers outside of the institution. For Mbembe, the movement to decolonize and moves toward interdisciplinarity are linked: he writes,

attempts at ‘transcending our disciplinary divisions’ have in fact been happening partly in response to a set of contestations affecting the disciplines that constitute the foundations of modern knowledge. Some of these contestations are of a political nature. In the case of South Africa, they have to do with profound and still unresolved questions of racial justice (2021, 80).

The situation in the UK is, perhaps, less advanced, but the focus of the decolonization movement here certainly opens up a different possibility for literature and science scholars examining the relations between the disciplines: it points toward the need to analyse critically, rather than celebrating or valorizing, the ways in which scientific and literary practices cohere to produce dominant structures of knowledge and to shore up institutional cultures. Rather than starting from a position of defending literary knowledge in the face of the domination of the sciences, literature and science scholarship might begin the more reflexive task of understanding how its own disciplinary omissions, indifferences to injustice, or unexamined norms contribute to a wider academic self-reinforcing and dominating system of knowledge.

3

An example of how this might be done is to be found in Katherine McKittrick’s book *Dear Science and Other Stories* (2021), which addresses the limitations of contemporary academic scholarship in the humanities when it comes to questions of race while at the same time modelling an interdisciplinary approach that offers a different orientation toward science from a humanities perspective. *Dear Science* consists of a series of stories which model, in their forms, the kind of interdisciplinary, creative scholarship that McKittrick puts forward as a counterpoint to established academic methods, where, she claims, “referential beginnings and referential scaffoldings shape conclusions” (2021, 23). Drawing on the work of Sylvia Wynter, one of McKittrick’s central claims is that academics—including those whose work concerns race—are trapped within a “bio-centric system of knowledge” (2). Various definitions are offered of this complex idea throughout the book, but in sum, McKittrick writes that

[a] biocentric knowledge system assumes that, as a species, we have evolved differentially according to our ethnic-racial differences. The result is a kind of Malthusian spatial-racial fallout. Race functions to naturalize this conception of the human. We must keep in mind that biocentricity is not the same as scientific racism or biological determinism. Scientific racism and biological determinism are ideologies that animate a pervasive biocentric belief system. (McKittrick 2021, 127)

According to McKittrick, the biocentric system is one which posits “black subjects as naturally unevolved and less than human,” a system that does not recognize biocentrism itself as a fictive narrative (2021, 126). Yet it is a system which underpins academic study and which, McKittrick contends, is primarily characterized by an emphasis on capturing data. Academic knowledge and methods are focused, McKittrick argues, on “the primacy of evidentiary and insular normalcies,” “the logic of knowing-to prove,” and the asking of “questions that result in descriptive-data induced answers” (4–5). These methods produce “a self-replicating learning system” (45) that, when it comes to the study of race, objectifies Black life through “the tendency to seek out and find marginalized subjects, who then serve as academic data and provide authentic knowledge about oppression” (32). A phrase that McKittrick repeats throughout the book is that “description is not liberation” (45) because the production of data, the tracking and quantifying of Black life, never really escapes the underlying biologic system which centres and repeats the objectification of Black people. This is even the case for scholars of race and racism, who, McKittrick argues, in supporting a social constructionist understanding of race, leave “the logic of biological determinism (and therefore racism) [...] within view” (134). She writes that the

social production of race can, inadvertently, mimic the crude classification and typology of humans according to racial–sexual differentiation: naming these racial and racist rankings and groupings and taxonomies of humans is replicated over and over again—whether as truth claims or socially produced fictions that seek to undo the weighty singularity of biological determinism (133).

McKittrick recognizes that this poses an “analytical conundrum” for anti-racist scholars, one which “echoes the concerns Fanon identified in 1952: How might we think about the social construction of race in terms that notice how the condition of being black is knotted to scientific racism but not wholly defined by it?” (135).

McKittrick poses several interrelated answers to this question which there is not space to detail here, but one way of beginning to counter the data-driven, biocentric, descriptive logic of the academy that McKittrick offers is for scholars to develop a new understanding of the relationship between Blackness and science, particularly Black creativity and science, a relationship that moves away from the assumption that Black worlds are “wholly defined by scientific racism and biological determinism” (2021, 1). Instead, McKittrick invites us to view Black creatives as “scientifically creative and creatively scientific” (2), which happens when we are able to “be uncomfortably satisfied with the unmeasurability of black life” (121). Black creativity, McKittrick contends, exposes and confronts the data-driven logics of academic study, and we can begin to understand how it does this if we (as scholars) adopt an interdisciplinary or, rather, ‘undisciplined’ methodology. This methodology involves “the generating and gathering of ideas—across-with-outside-within-against normative disciplines—that seek out liberation within our present system of knowledge” (47). This undisciplined method, encompassing, among other things, “gathering multifariously textured tales, narratives, fictions, whispers, songs, grooves” (4), requires a shift in understanding of the relations between the humanities and the sciences because it is a method which understands that “science and story are not discrete” (9). This idea will be familiar to most literature and science scholars, but McKittrick’s following suggestion that “we know, read, create, and feel science and story simultaneously” is perhaps less so. The aim, McKittrick contends, is not to describe science but to

[s]tudy [...] how we come to know black life through asymmetrically connected knowledge systems. Science is present [...] but it is restless and uncomfortably situated and multifarious rather than definitive and downward-pressing [...] This shift—from studying science to studying ways of knowing—has allowed me to work out where and how black thinkers imagine and practice liberation as they are weighed down by what I can only describe as biocentrally induced accumulation by dispossession. (McKittrick 2021, 3)

McKittrick’s method, then, consists of a refusal of disciplinary conventions and an embrace of storytelling where “telling, sharing, listening to, and hearing stories are relational and interdisciplinary acts that are animated by all sorts of people, places, narrative devices, theoretical queries, plots. The process is sustained by invention and wonder. The story has no answers” (2021, 6). It is a method that not only refuses disciplines but refuses distinctions between the academic and the objects of her

study, as “fact-finding, experimentation, analysis, study, are recognized as narrative, plot, tale” (8) and McKittrick becomes a storyteller, and in so doing reduces the distance between her work and that of the creative writers whose texts she discusses. This rejection of objectivity in favour of participation in the Black worlds in which she is invested, the insistence in thinking across disciplines, texts, and places, is crucial because it is the separation of the sciences from the humanities which McKittrick, via Wynter, identifies as the defining characteristic of our current system of knowledge; a system which has produced race and limited understandings of Blackness. She writes, “the work of discipline, so neatly and so quietly tied to the biocentric infrastructures of empire, forbids a genre of blackness that is not solely and absolutely defined by and through abjection, subjection, and objectification” (45–46). It is only by working against “the bifurcation of science and creativity,” a bifurcation which “reif[ies] racial differentiation” (137), that we can start to move toward a different understanding of Black life.

McKittrick’s work is in the vein of much Black feminist thinking, which has for some time called for storytelling to be recognized as a form of theorizing in academic contexts where Black people and their creative work has often been excluded from the theoretical. Emphasizing the open-ended, the dynamic, and the unverifiable, McKittrick resists attempts to capture, to contain, and to discipline as she grapples with ways of apprehending Black life beyond death, the body, and trauma. But what she adds to this is an explicit reckoning with science which I think offers us a different approach to literature and science studies, an approach that might be applicable to everyone in the field, not only postcolonial or critical race scholars. At base, McKittrick is as critical of the methods of the humanities as those of the sciences, and I think she encourages us to be less defensive and more open to the possibility that the humanities may be just as implicated as the sciences—in the kinds of questions it asks and answers it seeks—in maintaining certain structures of power. Her intervention forces me to ask myself how much of my own work has been descriptive or data-driven, even as it has, particularly in my book *Biofictions*, sought to understand race beyond disciplines and to articulate “multiple and untracked enunciations of black life” (McKittrick 2021, 105) through literature. But her work also inspires me to think, read, and know in a different way, and in the final section of this essay I would like to attempt an undisciplined reading of the events of 2020 from the perspective of where

I know from;⁷ that is, a reading which encompasses my thinking around disciplinarity, decolonization, race, literature, and science and medicine as much as it does my physical and academic location at a university in Bristol in the UK. What would it mean to tell a story that begins not with a description of the state of Black health in Britain but which, instead, decentres disciplinary norms in order to access a new understanding of Black life through undisciplined knowledge, practice, creative expression, and science?

I begin with a statue. That of Edward Colston, which was torn down in Bristol on 7 June, 2020 following a Black Lives Matter demonstration. I want to suggest that the Colston statue, when it stood, was a significant public health issue. Public health is defined by the WHO as “the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society” (Acheson 1988, 431–37).⁸ The Colston statue was a celebration of the slave trader Edward Colston, and while it remained standing, it was a symbol of injustice; a symbol of a failure to account for the legacies of slavery in a city still very much shaped by racial inequalities. A source of pain and oppression for the city’s Black residents and their allies who had been campaigning for its removal for years, the statue was a symbolic representation of racism and part of a wider hostile environment; symbolic of a system which is, no doubt, biocentric in the way that McKittrick describes. Colston alone was responsible for the enslavement of 84,000 Africans, 19,000 of whom died during voyages to the Americas and the Caribbean. His statue was a material symbol of the continuance of ways of thinking about Black people as less than human, of the residues and remains of colonialism that permeate public spaces and institutions, including universities, and which continue to impact on the health and wellbeing of Black people today.

So the people of Bristol’s undisciplined act in removing the statue, in the midst of a global pandemic which has affected Black people disproportionately, I think can be viewed as a public health intervention. They removed a source of real, felt pain; their act was a healing act which creatively countered the logics of historical remembrance, and the joy of this moment was captured by Vanessa Kisuule, who was the Bristol City Poet from 2018–2020. Her spoken word poem “Hollow,” published on Twitter, went viral in the days afterward:

7 The phrase is taken from an exercise developed from McKittrick’s work by Eugenia Zuroski (2020).

8 This is the definition adopted by the World Health Organisation in 2011 (iris.who.int/handle/10665/373580)

You came down easy in the end.
The righteous wrench of two ropes in a grand plié.
Briefly, you flew, corkscrewed, then met the ground
With the clang of toy guns, loose change, chains, a rain of cheers.
Standing ovation on the platform of your neck.
Punk Ballet. Act 1.
There is more to come.

And who carved you?
They took such care with that stately pose and propped chin.
Wise and virtuous, the plaque assured us.
Victors wish history odourless and static.
But history is a sneaky mistress.

Moves like smoke, Colston,
Like saliva in a hungry mouth.
This is your rightful home,
Here, in the pit of chaos with the rest of us.
Take your twisted glory and feed it to the tadpoles.
Kids will write raps to that syncopated splash.
I think of you lying in the harbour
With the horrors you hosted.
There is no poem more succinct than that.

But still you are permanent.
You who perfected the ratio.
Blood to sugar to money to bricks.

Each bougie building we flaunt haunted by bones.
Children learn and titans sing
Under the stubborn rust of your name.

But the air is gently throbbing with newness.
Can you feel it?

Colston, I can't get the sound of you from my head.
Countless times I passed that plinth,
Its heavy threat of metal and marble.

But as you landed, a piece of you fell off, broke away,
And inside, nothing but air.
This whole time, you were hollow. (Kisuule 2021)

The event reverberates in Kisuule's poem through images of dance, song, and poetry; the statue's fall is a creative release from the "heavy threat" felt by the poet when she walked past it. The movement and sound of the statue crashing to the ground is imagined as a source of inspiration for poets, children, and rappers, as for once it isn't a Black body which lies destroyed

but a once-celebrated hollow likeness of a man who, in Kisuule's words, "perfected the ratio, / Blood to sugar to money to bricks." This accounting, this data, is "permanent," Kisuule reminds us; but it is also displaced and, like the statue itself, ultimately hollow. Instead, Kisuule offers us in the performance of her poem an embodied, healthful, and joyful expression of Black life and creativity that emerged from this momentary release from the trauma of 2020. The crashing statue and poem together create sonic waves (and, in the case of the statue, literal waves) that pass through a city "throbbing with newness," an unquantifiable rebirth with reverberations that travelled up the hill to the University of Bristol and its Faculty of Life Sciences.

With the worldwide spotlight on Bristol, the University of Bristol began to intensify its efforts to address its historic ties to the transatlantic slave trade; and one of the things to emerge from this was, in fact, another statue. The Faculty of Life Sciences announced that it had decided to commission a statue of Henrietta Lacks, the African-American woman who, as she was dying from cervical cancer in 1951, had cancer cells taken from her body and cultured by a medical scientist, creating the first cells to survive outside the human body—an immortal cell line. Taken without consent, the existence and usage of the cells only became known to her family in the 1970s, and it is only more recently than that that the story of Henrietta Lacks has become more widely known. HeLa cells are now used routinely around the world and have played a role in many medical breakthroughs and research, including at the University of Bristol, where they have been used in COVID-19 research. Sculpted by Black Bristolian artist Helen Wilson-Roe, who had previously produced portraits of Lacks and established a relationship with the Lacks family, the recently erected statue is the first public statue of a Black woman made by a Black woman in the UK. With the announcement also came a commitment to "an educational plan that will mark the start of the Faculty of Life Sciences working on the decolonisation of our curriculum" (University of Bristol 2021). In this, the Faculty of Life Sciences joins many departments, schools, and faculties each working on a decolonizing agenda and, in many cases, working together on this ongoing process.

What I think this demonstrates, or rather an aspect of the story that I'm trying to tell here through the example of Bristol and my university, is that the broad and global movement to decolonize is arguably where the greatest contact, communication, and cross-disciplinary work between the sciences, arts, and the humanities is taking place within the contemporary university. It is decolonization and the search for racial justice which is bringing scientists and humanities scholars, as well as artists, writers, and

community activists around the same table, to share and discuss ideas and strategies in the name of changing institutional culture. It perhaps remains to be seen whether researchers across disciplines will continue to operate within the same closed biocentric system of knowledge, but the whole point of the decolonization movement at its most radical—and we can certainly debate what kinds of non-radical or watered-down versions of this project may be emerging—is to bring into question the dominant system of knowledge and the disciplinary cultures and divisions that persist within it. The events of 2020, within the broader context of the movement to decolonize, have in Bristol brought about projects which traverse the medical, scientific, humanistic, artistic, and public; conversations which refuse the usual boundaries of faculty, and academic vs non-academic, and perhaps offer an opportunity to start to overcome the “bifurcation of science and creativity” and the attendant reduction of Blackness to abjection that McKittrick describes. The city’s Black poets and artists, like Vanessa Kisuule and Helen Wilson-Roe, celebrate this change, and their work and engagement with the city and university points toward ways in which we might begin to re-envision Black health and life through creative research, art, and writing in which data capture and description are replaced by a renegotiation of the definition and boundaries of science and creativity which speaks directly to the communities in which we work and live. For those of us who work in literature and science studies, the lesson, I think, is for us to recognize the kinds of interdisciplinary tales that might otherwise pass us by; stories in which we, through our institutions, cities, and communities, are deeply embedded.

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Graham Huggan

What's a Colony?

Scattered Speculations on Invasion Science, Eco-Narrative, and the Misuses of Alien Species

ABSTRACT This chapter considers what a postcolonial–ecocritical approach might have to add to the ongoing debate over native versus invasive species, looking in particular at the function of eco-narrative as a template for empathy or cooperation across the species divide. Two examples will be drawn upon. The first, Germaine Greer’s 2013 memoir *White Beech*, tells the story of Greer’s attempt to restore a plot of land in the Queensland rainforest by adjusting the ratio of native to invasive species. The second is my own account of the recent travails surrounding a ‘native invasive’ species, the spruce bark beetle, which has colonized large areas of old-growth European forests, with destructive consequences in some cases but generally mixed ecological results. In both examples, I will move between scientific and popular understandings of the human/non-human interactions involved, asking what is to be gained—but also risked—by seeing biological processes in cultural terms.

KEYWORDS colonization, eco-narrative, invasion science, invasive species, native species

Part I: Bugs

Behold *Ips typographus*, otherwise known as the European spruce bark beetle (Fig. 1), a potentially highly destructive class of insects whose bark fares very much worse than its bite. Bark beetles, a sub-family of the weevil found worldwide, are so known because they tunnel under bark in search of nutrients, and while most species—*Ips typographus* included—usually colonize diseased or dying trees, they are liable to attack living ones when their numbers are high, as is increasingly the case as global temperatures warm (Hlásny et al. 2019; Vega and Hofstetter 2015). Whether bark beetles



FIG 1. A female of the European spruce bark beetle (*Ips typographus*). Gilles San Martin via Flickr.

are pests or not is a question of scale as well as of perspective. They are certainly—to borrow the standard ecological term—major forest “disturbance agents” (Vega and Hofstetter 2015), but the jury is out on whether such disturbances are just part of the natural scheme of things or whether they require immediate human intervention as well as a fully worked-out system of eradication and population control (Hlásny et al. 2019; Müller and Job 2009; Seidl et al. 2015).

Why the fuss about bugs? First, I’ve been interested for some time in what happens when the vocabulary of colonies and colonialism is applied to what environmental humanities scholars call the more-than-human world—a world in which animals (including bugs) vastly outnumber humans, and in which the lives of non-human others, including those of species that may seem inimical or alien to us, are deeply and inextricably entangled with our own. Second, I’m interested as well in what happens when biological processes are translated into cultural terms, and in the possible gains as well as obvious pitfalls involved in such biology-to-culture transfers. What happens, for example, when animals, rather than human beings, are seen as the colonizers? And what happens when these creatures’ colonizing activities, popularly interpreted, are translated back again into the human cultural domain? What’s a colony, and who decides? Who or what gets labelled as alien, and why?

These last two questions have long been central to postcolonial studies, and if anything, their resonance has only increased in the wake of what might loosely be described as the humanities’ ‘ecological turn.’ What the word ‘colony’ means depends, of course, on from whose perspective it is seen, as well as on who has the power to control the definition. It’s

thus unsurprising that the two standard geopolitical definitions of colony work in entirely different directions: as a country that's controlled by a foreign power, or as a group of people living in a foreign place. Biological definitions of colony are ostensibly less political: individual organisms living together in close association, often though not necessarily in large numbers (colonies of bacteria, for instance, or colonies of insects, which have the capacity to colonize larger organisms in their turn).

Such definitions are, of course, more political than they seem, or at least susceptible to all kinds of political uses and abuses—one prominent example being the ongoing debate over native and invasive species, in which the latter are often seen simultaneously as alien even when there's abundant scientific evidence, in a good number of cases, that they're not (Fall 2013; Warren 2007). The study of invasive species has generated a field of its own, *invasion science*, which deals with the spread and impact (nearly always seen as negative) of 'alien' or 'exotic' species and considers ways of keeping their numbers under control (Hui and Richardson 2017). Needless to say, biology-to-culture transfers, which are perilous at the best of times, are particularly dangerous here, and the field of invasion science—on which more later—has been seen, not always fairly, as implicitly or even inherently xenophobic in the context of our turbulent political times.

My general aim in this chapter is to consider what a postcolonial-ecocritical approach might have to add to a debate that is all too often grossly simplified or polarized, looking in particular at the function of eco-narrative as a template for empathy or cooperation across the species divide (Heise 2005). I will work with two examples. The first of these has a German location, namely, the Bavarian National Forest, which has been subject for some time now to periodic bark-beetle infestations that are frequently seen, though not necessarily acted upon, in 'invasive' terms. The second example is from the other side of the world—Australia—and focuses on a literary text. Germaine Greer's 2013 memoir *White Beech* ostensibly recounts its author's attempt to rehabilitate a plot of land in the southern Queensland rainforest by adjusting the ratio of native to invasive species to be found there. However, as will shortly be seen, it's also interested in the implications of this restoration project for Australia's continually evolving settler culture: one in which a social-ecological history of invasion (whether or not this is acknowledged) is overlaid on indigenous foundations, and in which settler and indigenous understandings clash but also commingle, producing uneasy trade-offs that are signs of settlers' frustrated desires to claim the common inheritance that might license the impossible task of becoming indigenous in their turn (Goldie 1989).

In comparing these two examples, I want to reflect on the extent to which some of the descriptive language used to talk about native and invasive species is both scientifically inaccurate and potentially counter-productive, even when that language is used by scientists themselves (Fall 2013). I also want to use the two examples to shed some preliminary light on some of the 2021 GAPS conference's main themes: the role of science in contemporary and historical struggles for social and environmental justice; the entanglements of science with its modern-day cultural contexts; and the mediating function of narrative in alternating between scientific and popular understandings of the various human / non-human actors and interactions involved.¹

Now back to bugs. In his 2015 book *The New Wild: Why Invasive Species Will Be Nature's Salvation*, the British science writer Fred Pearce provocatively suggests that conservationists have got it wrong about going all-out to protect the world's most vulnerable spaces and species; and that the outdated, increasingly embarrassing myth of 'pristine nature' needs to be replaced by a hard-headed recognition of nature's resilience—never more so than “in the face of the considerable damage humans have done to the planet” in recent times (1). Emblematic of this resilience, for Pearce, are invasive species, whom he gleefully batters upon as “nature's vagabonds” (1), destructive when they want to be but “model eco-citizens” (3) most of the time.

There's something to be said for this view, though, like many an environmental writer seeking to address a general audience, Pearce dismantles one binary ('native species good, alien species bad') only to install another. Thus, while he's surely right to point out the “green xenophobia” (1) that lurks behind attacks on invasive species and the various moral panics that have accumulated around them, he's just as surely wrong in accusing conservationists of being “the ethnic cleansers of nature, neutralising the forces of nature they should be promoting” (5) and woefully misguided in their efforts to protect the weak and vulnerable, whereas nature generally tends to favour “the wily and the strong” (137). This risible caricature of conservationists *en masse* substitutes the demonization of animals with the demonization of humans in a sweeping move that is characteristic of some of the coarser kinds of first-wave ecocriticism (Edward Abbey's memorable if sadly idiotic mantra, “I would rather kill a man than a snake,” comes readily to mind [Abbey (1968) 2018, 37]). Notwithstanding, Pearce's

1 Some of the arguments, as well as elements of the prose, presented in this chapter have appeared before in the following: Huggan (2020); Huggan and Huddart (2020); Huggan and Marland (2023); Huggan and Šimková (2023).

defence of so-called “novel ecosystems” in which native and introduced species are successfully combined has sound scientific backing, while old-school arguments for nativist protection—which often assume that invasive species are necessarily alien species—have been wearing thin for some time (Morse et al. 2014; Thomas 2017).

Enter the beetles. “Forget Brexit, fear the beetle invasion,” fulminates Sam Manning in an inadvertently hilarious 2019 letter to the *Guardian* (proving, among other things, that not all letters of this kind end up in the *Telegraph* or the *Mail*). In the letter, Manning vividly prefigures the imminent incursion of the European bark beetle—one assumes he means our friend *Ips typographus*—on British shores and its shattering consequences. If this particular beetle *were* to end up in the UK, it would be classified as an invasive species, though ironically, it's only on the other side of the Channel that invasive species are co-classified as aliens (the official EU-sanctioned term is ‘invasive alien species’ [IAS]). What's more, there's evidence to suggest that bark beetles in Europe are often popularly perceived as alien invaders when, in fact, they're not: *Ips typographus*, for example, is usually classified as a *native* species, albeit one that, over time, has significantly extended its natural range (Hlásny et al. 2019; Müller and Job 2009). This is more than just semantics. The threat of alien invasion is the stuff of paranoid nationalism, and bugs (the word itself is tell-tale) have long been subject to such hysteria, playing to trumped-up fears and anxieties that are often as multiple, ubiquitous, and magnified in the imagination as the bugs themselves (Hage 2003; Leskosky 2006).

The larger point I want to make here is that the distinction between native and invasive species is both conceptually inadequate and open to all kinds of manipulation. Native species are quite capable of invading, while ‘invasives’ may be entirely harmless, contributing to biodiversity rather than diminishing it (Pearce 2015, 23). Whether this justifies Pearce's celebration of the “new wild” is another matter. One of Pearce's main points is that “messed-up places” (230) such as urban waste grounds and derelict sites are capable of nurturing diverse wildlife just as much as, if not more than, the carefully “re-engineered ecosystems” (125) we create for it. Degraded forests, for example, those of the kind that are subject to intensive logging or repeated beetle attacks, presumably come into this first category. But while few, least of all professional ecologists, would dispute that such places can become seemingly unlikely sites for future revivals, such ecological recoveries are not enough in themselves to justify the negative environmental impact of logging; nor do they simply wish away the widespread damage done by bark beetles to old-growth forests that are undoubtedly resilient but don't have an unlimited capacity for self-repair.

Conservation is a delicate balancing act in ecosystems that its practitioners simultaneously recognize as being inherently unbalanced; the precautionary principles on which it is generally based are not aimed at eliminating disturbance but, on the contrary, at *maintaining* so-called “natural disturbance regimes” by creating or consolidating the “structural features with which [different] species have evolved” (Hamblen and Canney 2013, 249; see also Denslow 1985). This suggests that the best way of dealing with bark beetles might be to let them do their work, as has tended historically to be the case in the Bavarian National Forest, but also to monitor their actions closely, not necessarily ruling out the possibility of intervention or even programmatic eradication if this is felt to be justified at the time (Müller 2011).

What it also suggests, though, is that a different kind of management—the management of *public perceptions*—is needed, not least so as to adjust romantic conceptions of what forest landscapes ‘should’ look like, or to counteract negative attitudes, often shared by local inhabitants and visiting tourists, towards the beetles themselves (Müller and Job 2009). Developing practices for perception management is arguably a task for the empirical social sciences, but text-based humanities perspectives are useful here, too, especially those that focus on historical and cultural framings of what particular spaces and species mean. In the case of bark beetles and other potentially destructive insects, there are particular challenges. As Richard Leskosky observes in a fascinating essay on the evolution of the “big bug film,” insects are

as foreign to human experience as any familiar creature could possibly be. We encounter them every day, often in our own homes, yet they are inalienably different from us [...]. There is no emotional connection between the human world and the insect world even though our existence arguably depends on theirs. They are the ultimate alien creatures and become only more so when they prey on us. (2006, 352)

There are several good reasons for this ‘alien’ status. Insects are everywhere—there’s no escaping them—and they have a frightening capacity to multiply. Despite their short lives, they’re collectively more durable than we are; and despite their small size, they’re often hugely resilient, with their exoskeletons functioning as a sort of ‘look-at-me’ armour that makes them seem menacing and adversarial even when they’re not—or at least not towards us. Insects are our kin, but they have little interest in us other than, for some species, to prey on us. They also have an inventory of horrible habits, some of them memorably described in Annie Dillard’s classic

1974 nature study *Pilgrim at Tinker Creek*. “I never ask why of a vulture or a shark,” Dillard complains, tongue only half in cheek, “but I ask why of almost every insect I see. More than one insect—the possibility of fertile reproduction—is an assault on all human value, all hope of a reasonable god” (2018, 64).

In the historical gallery of representations, beetles may fare better than many other insects—but not much. As any entomologist will tell you, beetles are among the most useful organisms on the planet and deserve our greatest respect, but most popular perceptions suggest otherwise (Jones 2018). There are notable exceptions, of course—the sacred scarab beetle, for instance—but for many people worldwide, beetles are lowly creeping things, unsettling to behold and associated with the dirt and dust that is many species’ natural habitat. Some species are also associated with harm, although in the vast majority of cases, beetles go about their business without the slightest interest in disturbing us or, indeed, the slightest interest in us at all (Cambefort 2006). That said, beetles, like other insects, are very much part of our lives and belong to a more-than-human world in which human and non-human lives are cross-hatched, with the ongoing panic over the global die-off of bees serving as the latest reminder that some insects could probably survive without us, but we definitely could not survive without them.

Insects, on the face of it, are both living embodiments of a multispecies world and confirmation of the viability of the various theories that surround it: those tangled theories of creaturely encounter that have become the staple of the latest ecocritical fad, multispecies ecocriticism, even if, like other similarly vaunted ‘new’ paradigms and movements, it’s quite possible to argue that multispecies approaches have been around for some time (Kirksey et al. 2015; Van Dooren et al. 2016). Multispecies studies, like the cluster of new materialist theories on which it is based, revolves around a series of loosely connected attempts to describe the more-than-human world in terms that are equally loosely drawn from complexity science, especially (though not exclusively) non-equilibrium ecology and quantum physics. Invasion science—the composite term coined by contemporary biologists to describe “the full spectrum of [disciplinary] fields of enquiry that address alien species and biological invasions” (Hui and Richardson 2017, 1)—is similarly indebted to complexity. Recognizing that widespread biological invasions are a defining feature of our times, invasion science simultaneously registers the fact that these invasions can be “wicked” problems (2017, 303). Hence the South-Africa-based biologists Cang Hui and David Richardson’s term “invasion dynamics” (also the title of their 2017 book), which takes in the actions of invasive species but also

the reactions of the larger social–ecological systems within which these species are contained. Together, these actions and reactions form part of a complex network of elements and forces that interact in ways that are not always controllable or predictable, and in which patterned responses to invasive activity must confront unstable social–ecological systems that are caught up in a more or less continuous process of change (2017, 307).

This is a far cry from the crude populist rhetoric that has sometimes accompanied the native-versus-invasive-species debate, but not necessarily a convincing alternative to it. Hui and Richardson are understandably keen to point out that by no means all alien species become invasive, but reluctant to concede that there is at least some room for category confusion, while the vitriol with which they describe those few “xenophobes [who are] obsessed with eradicating all non-native organisms,” and whom they see as being confined to the extreme “fringes of the conservation movement,” suggests that they themselves are not above using emotive language to dismiss their opponents, who are either dubbed as swivel-eyed fanatics or derisively accused of not being “scientific” enough (11).

A large part of the problem is that invasion science has yet to come to terms with the burden of its own history, linked as this is to so-called Discovery Age imperialism, which involved “the rapid transfer of people, goods, and organisms on ships over long distances, [resulting in a sometime radical] human-mediated reshuffling of the world’s biota,” the legacies of which are still very much with us in current times (Hui and Richardson 2017, 2; see also Crosby 1986). Another part of the problem is that scientific language is not only not metaphor-free but susceptible to having its metaphors used for purposes over which it has little control. As the Swiss-based geographer Juliet Fall observes, science cannot just purge itself of its own metaphors: what’s needed instead is a much clearer sense of how these metaphors work and who stands to gain from them—also, who stands to lose out (Fall 2013, 174). This is especially an issue when the figurative language used is emotionally charged. As Fall notes, the language surrounding the native-versus-invasive species debate has frequently been militarized (“the war on invasives,” etc.), though, optimistically perhaps, she sees a “more cosmopolitan approach to welcoming invasive species [as] beginning to return” (176).

Fall is careful not to dismiss adversarial language *tout court* insofar as this can stimulate collective action against invasive species, but such language also risks creating social as well as ecological animus against perceived ‘outsiders’ that is as destructive as, if not more destructive than, the species themselves (171; see also Larson 2005, 495). And as she further concedes, it’s hard to get away from the anxiety that invasion rhetoric whips up, not least because of its historical associations with *invasion narratives*: those

lurid fictions of alien conquest that never really disappear from the cultural scene altogether, but tend to re-emerge in intensified forms in volatile political times.

One possible alternative to invasion narrative is *eco-narrative*. Eco-narratives, Ursula Heise suggests, take in everything from “mythological creation stories [to] science fiction novels [to] filmed nature documentaries” (2005, 129). They are more than just writing about nature, but also more than just storytelling in the service of environmentalism. Eco-narratives *are* environmental texts insofar as they pass “ecological tenets through rhetorical, linguistic and cognitive strategies” (Soloshenko 2015, 5), adopting an inclusive approach to storytelling that “strives to compose *with*, not *for*, [the various] non-human characters” it portrays (Donly 2017, 17; emphasis added). However, they are perhaps better seen, as Heise herself sees them, as broad vehicles for cross-species empathy in which “the natural world comes alive for the human observer,” and ecosystems are seen “not only in their local and regional manifestations, but also in their global [and planetary] reach” (2005, 129–30).

To put this differently, eco-narratives stress connections and variant ways of understanding interconnectivity: clusters of genres rather than genres in themselves, they're probably best defined in terms of the human-animal kinships they foster as well as the various historical and geographical crossings they perform. Multispecies-inspired ecocriticism, I want to suggest, offers one particular kind of performative eco-narrative in which there is no clear dividing line between social and natural history, the human and the natural world. However, in the second part of this chapter, I want to focus on another kind: one that addresses the native-versus-invasive species debate, but from a postcolonial perspective that positions this debate within the larger historical context of the ecological imperialism that underlies it and that it, in turn, narratively informs. This, as previously announced, is Germaine Greer's *White Beech*; and, with it, the chapter moves from beetle-infested trees to the trees themselves and the forest vegetation that surrounds them—or, to put it more prosaically, it shifts attention from *bugs* to *weeds*, from zoological to botanical pests.

Part II: Weeds

“Every woman's life [is] an inexorable series of changes to which she has to adapt as well as she can,” Greer announces in the prologue to *White Beech* (2014, 1), self-consciously positioning the text as an ecofeminist version of landscape memoir: transformative personal record as well as revisionist

historical exploration of the continually shifting relationship between land and self (Wylie 2007). The land in question is an abandoned small-holding, the site of a former dairy farm, that Greer impulsively acquires at Cave Creek in the montane rainforest of southern Queensland, and the narrative spun around it is one of dual rehabilitation, in which the restored land acts as a sanctuary for native animals and plants as well as an opportunity for the much-travelled Greer to come back into her own again, to reclaim her Australian settler heritage even as the land is “given back to itself” (2014, 343).

‘Reclamation’ is perhaps the wrong word insofar as much of Greer’s account concerns itself with the gleeful dismantling of settler history, which is associated first and foremost with environmental destruction and those particular, colonial forms of sexism and speciesism it underwrites. As one might expect from Greer, the brutishness of men looms large in this account, as in the following, typically withering description of the actions of one Din Guinea, whose family were previous owners of the land that now belongs to her (though, equally typically, she disclaims all such ownership, insisting that the forest has proprietary rights over her rather than the other way around). Trees, as so often in the text, are the victims of the crime: “In 1893 [...] Guinea, working in the forest at Cave Creek along with his mate Sandy Duncan [...] came across the biggest cedar they had ever seen. Confronted with this botanical marvel [...] deep in the trackless forest, the only thing they could think to do was to cut it down” (184). Cut down in their turn, Guinea and Duncan are in good company in the text, which also includes a series of entertaining sideswipes at Australia’s pioneer botanists, many of whom were wont to use their old-world status to assert their (male) authority over the new world “in the name of scientific method” (216) and who were all too eager to name the various plant species that they claimed to have discovered after themselves.

As Greer shows, several of them were just as quick to introduce decorative exotics to Australia. This favourite colonial pursuit would later pave the way for the spread of numerous invasive species—lantana, Kikuyu grass, balloon milkweed—whose destructive legacies Greer must now contend with at Cave Creek, where, in a memorable image, she visualizes herself on her knees vainly attempting to weed the rainforest, “like Canute trying to hold back the tide” (209). Weeds are sworn enemies in *White Beech*, standing between Greer and her rehabilitation project, which she envisages in terms of “removing obstacles”: “The forest,” she says at one point, “can reclaim its own only if obstacles are removed,” and her appointed task is to help it “defend itself against [those] invaders” that are holding back genetic diversity, her personal conservationist goal (111–12).

For all the taxonomic grandstanding of the text, in which Greer and her geeky sister Jane trade their scientific knowledge of native and imported plants, it often recodes itself in popular terms, as one spirited amateur's attempt to turn colonial environmental history around and, in so doing, to defend the nativist principles on which her parallel journey of self-reckoning, her own personal rehabilitation, is based. This makes for some uncomfortable moments, such as when she is accused by one of the local farmers, Leon, of "rabid nationalism" and is taken to task for disowning her own cosmopolitan background: "'I'm an exotic,' [Leon] said. 'Purebred from Bialystok. And you're a hybrid from everywhere but here. You might as well say we've got no right to be here.' 'I have said that.' 'Don't be silly,' said Leon" (49).

Clearly, not all of Greer's battles are won; and one, in particular, is conceded from the get-go. The right to native title, Greer insists, belongs to Australia's First Peoples alone and, as such, is non-negotiable, however much the historical record might point to competing or even confabulated land claims (77). This puts Greer's own nativism in perspective; it also helps explain the fundamental self-contradiction behind her repeated attacks on invasive species throughout the text. Simply put, Greer is an 'invader,' too, and she is painfully aware that the destructive history she is dismantling is effectively her own. She struggles with this knowledge from the start, and her ironic reward is to be repeatedly reminded of it. A typical early exchange is with her practical-minded sister Jane:

"What's the plan?"

"To restore the forest."

"That's obvious. But how?"

"I have no idea. You can help me."

"You reckon. I don't know anything about this vegetation. [...] I don't even know the genera that grow here, let alone the species. Rainforests are the most intricate systems on earth. That's why when they're disturbed, everything goes haywire. You might think you're restoring what's there, but in fact you're just another interloper, doing more harm than good."

I took a deep breath. "I can learn. We can learn, together."

"You don't get it, do you. There are no teachers." (99)

Jane is right, of course, at least to some extent; and although the Cave Creek Rainforest Rehabilitation Scheme (CCRRS) may go some way towards achieving its stated goal of protecting native flora and fauna, it does so against a mixed historical background in which an exploitative settler-colonial past is interwoven with the significantly longer histories of the area's traditional owners as well as those of native animals and

plants. Thus, while Greer's focus is on establishing a niche—"making a niche for [native animals] means finding a niche for you too," she says towards the end of the book (342)—*White Beech* opens out onto a broader national past in which the parallel histories of Australia's Indigenous and settler peoples, even given their disproportionate timespans, are inextricably entwined.

Thus, to read the text in allegorical terms, as being motivated by an ecological version of postcolonial guilt for the environmental damage caused by taking land away from Australia's original inhabitants, is to oversimplify it. It's certainly true at one level that the CCRRS is part of a larger reckoning with the colonial past as well as a personalized gesture towards postcolonial settler belonging; and it's true as well that Greer is aligned, whether she admits it or not, with a history of invasion that has helped produce other invaders—alien species that have colonized entire ecosystems, strangling them into submission (87)—in their turn. But what's also clear is that the popular ecological discourse of 'natives' and 'invaders' is insufficient to account for either the postcolonial present or the colonial past, whether these are seen in exclusively human or more inclusive ecological terms. And what's clear, as well, is that a more technical 'scientific' account of social/ecological interaction won't do either—and that Greer is well aware of this. *White Beech* hides behind its science as much as it displays it, with some of its more technical exchanges, such as Germaine and Jane's convoluted attempts to identify the 'correct' taxonomic category of particular plant or animal species, always risking descending to the level of farce. In some sense, the text is the more convincing the less 'scientific' it is trying to be, as in some of its earlier descriptive gestures towards ecological inclusiveness: "The forest is not just the trees, it is everything that lives in and on the trees, every fungus, every bug, every spider, every bat" (35).

Far from having explanatory power, the language of scientific classification serves instead as an instrument of control, historically exercised by men but now wielded in much the same narcissistic way by ambitious women—not least Greer herself. There is thus a profound irony behind Greer's attempt, not just to rehabilitate 'her' land but to reclaim the history of botany as a serious scientific pursuit either dominated by men (in the colonial period) or dismissed by men (in the postcolonial one) as a "girly version of the hard sciences [with] its inferior status reflected in its [hierarchical] career structure" (211). In trying to outdo men, Greer is also playing their games, using the protocols of scientific method in order to assert her own authority. But the irony works both ways insofar as scientific method is subordinated in the text to a form of sibling rivalry played out between two competitive women who *are* both scientifically literate—especially

Jane, a professional botanist—but are also determined to knock spots off each other if they can.

A similar double logic is at work in *White Beech*'s function as eco-narrative. Here, Greer mobilizes an ecofeminist language of care to support her search for kinship with the forest, which is itself seen in ecological terms as a complex kinship system in which multiple agents (creatures both great and small, organisms both human and other-than-human) productively interact. Humans are both dwarfed by this system and primarily responsible for its welfare, especially the welfare of its most vulnerable denizens, as becomes clear in the later stages of Greer's rehabilitation project, where the CRRS is described as a kind of sanctuary in which those species most at risk—also those most persecuted by humans—are given shelter so that they can breed in relative safety, living more or less on their own terms (333). While not seen in a specifically gendered light, this echoes first-wave ecofeminist calls for an environmental ethics of care by the likes of Greta Gaard, Karen Warren, and (behind them both) Carol Gilligan, all of whom acknowledge the three-way links between ecological disruption, capitalist exploitation, and a global patriarchal system that looks to consolidate the sexist/speciesist hierarchies it creates (see, for example, Gaard 1993; Warren 1997; Gilligan 1983). At another level, though, *White Beech* resonates with the more recent work of Donna Haraway, which emphasizes kinship ties between human and non-human species and which privileges the symbiotic or, in Haraway's characteristically idiosyncratic terms, "sympoeitic" interdependencies through which our lives are linked to others in a series of mutual "becomings" where "becoming is always becoming *with*, in a contact zone where the outcome, where who is in the world, is at stake" (Haraway 2007, 244, emphasis in original; see also Haraway 2016).

A Haraway-esque reading of *White Beech* is certainly possible, but it's complicated by Greer's residual animus towards alien species, which suggests that some interspecies 'becomings' are to be embraced while others are to be avoided, and which summarily rejects the hybrid ecologies that Haraway's eco-cosmopolitan philosophy implicitly supports. As an eco-narrative, *White Beech* is thus Janus-faced, acknowledging that "speciesism dies hard" (301) and that ecosystems frequently depend on the least glamorous of their species, but foregoing empathy in the case of those invasive species deemed to put the wellbeing of their native counterparts under threat. For Greer, the niche is the native and the native is the niche, but at the same time, the text recognizes the impossibility of this homology as well as the ideological purism it supports. White beech trees, for example, are few and far between at Cave Creek, but, in a gesture to protect them, Greer admits her concern "to keep our races pure, at least until

we know more about the exact identities of our species, subspecies and varieties, and the extent of their variability” (30). This working premise, while not objectionable in itself, opens the text to the criticism that its conservationist principles are ideologically motivated, a criticism that Greer is repeatedly confronted with and never quite manages to fend off (65, 99).

I want to close now by considering what Greer’s text might have to tell us about conservation and to draw some provisional conclusions about the value of science, and more particularly *popular* science, in conservation-oriented literary texts. Greer clearly sees herself as a conservationist *avant la lettre*, but it’s less than clear what she actually means by this. The closest she comes to explaining what she means is at the end of the book, when she reiterates her support for conservation as private enterprise: “The private landholder [she says], whether individual or corporate, has a better chance of maintaining conservation values than a public entity that has to provide a public amenity. Private landholders can defend hotspots of endemism as public bodies cannot” (343). This confirms her distrust of an interfering state as well as her distaste for such exploitative commercial ventures as wildlife tourism: animals, she says dismissively, “are sick of being watched” (342). It also positions conservation as a popular pursuit in the hands of enthusiastic (and suitably resourced) amateurs whose scientific qualifications seemingly count for less than the time and energy they are prepared to dedicate to their cause.

This defence of amateurism positions *White Beech* as both a popular work on nature conservation and a call for its democratization in a country (Australia) where “inaccessible scrubland comes cheap” and “you don’t have to be rich to make your own nature reserve” (342). While the situation is very different in the UK, I suspect that Greer would agree with the British geographer Bill Adams’s wide-angle view that conservation is as much about the choices ordinary people make as about larger administrative efforts to set the terms of engagement between people and the natural world (Adams 2003, 209). The nagging question remains of how much ordinary people know and whether they can learn quickly enough from their experiences to make a difference. Greer’s project is a relative success, but she is hardly starting from scratch, and, loath though she sometimes is to take advice from those who know more than her, she generally listens to her interlocutors more than she lets on.

This raises the further question of popular science and its role in disseminating knowledge about the environment. At one level, popular science is about bridging the heavily constructed divide between professional expertise and public ignorance (Huggan 2013, 224). However, as scholars in the field are quick to point out, to assume that the public are ignorant

is as naive as to assume that professional experts are the sole authorities on scientific matters—even if it's also misguided to imagine that popular understandings of the natural world offer equivalent forms of epistemic authority, however empirically grounded or solidly experience-based (Huggan 2013, 25; see also Gregory and Miller 1998). To her credit, Greer doesn't claim an expertise she doesn't have; nor does she claim (at least in a professional sense) to be a scientist, though in *White Beech* as elsewhere in her work, she is by no means averse to using her celebrity to claim a hold over the public that's not necessarily vouchsafed by a lifetime of high visibility in the public eye.

What she *does* claim to be is a storyteller: *White Beech* declares at the start that it's "the story of an extraordinary stroke of luck" (1), and it promises at the end that its "story will continue" (338), while in between it skilfully weaves together stories, both historical and contemporary, of encounters between people and the various environments they fashion after themselves. This suggests, in turn, that the value of literary works like *White Beech* in contributing to debates on nature conservation lies primarily in their ability to use the techniques of narrative style—modulations of perspective and voice, temporal shifts, strategic uses of figurative language—to connect with audiences on an emotional as well as intellectual level, reflecting what the American cognitive literary critic Patrick Colm Hogan calls the "emotional structures" that are embedded within narratives themselves (Hogan 2011).

Science communication obviously benefits from these techniques as well, and few scientists today, even the most hardnosed of positivists among them, are unaware of the value of telling a good story or of the benefits of adjusting it to the needs of the different constituencies and communities it serves. Nor, as I have argued above, are scientists unaware of the metaphors they deploy, of the inherent trickiness of figurative language. Metaphors, says Juliet Fall, "introduce a fundamental trade-off between the generation of novel insights in science and the possibility of dangerous misappropriation" (2013, 174). Much the same can be said for novel insights in the arts. The various technical languages we speak and write are rarely, if ever, transparent—though this is certainly no excuse for academic obscurity—and the new, scientifically informed ecocriticism, which is replete with sometimes extravagant specialist language, is far from immune from this perhaps-all-too-familiar charge. That said, humanities scholarship today is more scientifically attuned than it once was: more likely to forage across the disciplines; more inclined to build bridges between the natural and social sciences and the arts. At the same time, many humanities scholars—including myself—still have much work to do

to improve their scientific literacy, the lack of which is sometimes hidden in the use of fashionable pseudo-scientific terms. Let me return now to where I began. Professional ecologists have warned us that bark beetles are here to stay, including in Europe's national parks; the question is how to go about living with them. Ecocritics and environmental philosophers are not ecologists, nor, in their defence, do they claim to be; but both parties have much to learn from one another. Perhaps the best thing for both is to find a common language—never an easy thing to do, but hopefully one more comprehensible than bark-beetle hieroglyphics²—which goes some way towards bridging their professional divides.

Image credit

Fig. 1 <https://www.flickr.com/photos/sanmartin/49263656258> (CC BY-SA 2.0).

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2 See, for instance, Bark beetle tracings. Carola Ballat via Flickr. Uploaded May 19, 2020. <https://www.flickr.com/photos/184958786@N04/49911818233/in/album-72157714597875376/> (CC BY-NC-SA 2.0).

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The Sixth Extinction and Postcolonial Literature: Dairy Production, Vulture Extinction, and Arundhati Roy's *The Ministry of Utmost Happiness*

ABSTRACT This chapter reflects on the relationship between postcolonial literature and mass extinction. To do so, I begin by situating the current worldwide loss of biodiversity within the context of the wider planetary crisis of climate change. I then explicate the concepts of 'extinction' and 'mass extinction' before juxtaposing them both with the recent scientific development of the 'Sixth Extinction' thesis, which posits that we are living through a human-induced, or as I call it *socially produced*, mass extinction event. From here, the chapter turns to the Indian subcontinent, examining one local example of the Sixth Extinction in process: the rapid decline of India's vulture species across the past three decades. Finally, the chapter ends with a close reading of Arundhati Roy's *The Ministry of Utmost Happiness* (2017), a novel which begins with—and is thus framed by—this story of vulture extinction. I argue that Roy's novel, while self-consciously electing to 'notice' the vultures' passing, also casts doubt on the power of literary noticing as such, thus declining to valorize storytelling as a response to mass extinction.

KEYWORDS Arundhati Roy, postcolonial literature, the Sixth Extinction

1

Monday 9 August, 2021. Wildfires rush through Southern Europe and Siberia. In America, a red tide sweeps up the Florida coast after a toxic breach at a phosphate plant.

The day I sit down to start writing this chapter turns out to also be the day that the IPCC, the United Nation's Intergovernmental Panel on Climate

Change, releases its latest major report. Titled *Climate Change 2021: the Physical Science Basis*, the report assesses and synthesizes the most up-to-date findings on the scientific knowledge of climate systems. Researched and written by a working group of over 100 volunteer scientists, the report offers the headline conclusion that it is “unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred” (IPCC 2021, 4).

Despite the document's passive syntax and bureaucratic language, it is striking just how directly it confronts both the actually existing and projected impacts of climate change. Published with an eye towards COP 26, the pandemic-delayed UN climate summit in Glasgow, held in Autumn 2021, the report emphasizes that climate change is already transforming life as we know it: it is intensifying the water cycle and warping rainfall patterns, producing flooding in some places and droughts in others; melting the ice caps and permafrost, leading to sea level rises and coastal erosion; its marine heatwaves are starving the seas of oxygen, damaging ocean ecosystems, and creating difficulties for the communities whose livelihoods rely on them. Carbon dioxide levels are today at their highest point for 2 million years. Greenhouse gases, pumped into the air through the burning of fossil fuels, are destabilizing the environmental conditions which have facilitated the rise of human civilizations. In Paris in 2015, at COP 21, governments established the goal of keeping global warming below 1.5°C above pre-industrial levels. Six years on from these much-vaunted accords, the IPCC's 2021 report suggests that it is increasingly likely that global temperatures will breach 2°C during this century.

Since it is a report on earth systems and climate futures, written mostly for policymakers, I am not reading this document expecting to find much on biodiversity. Such work will surely appear later, when the IPCC publishes its more expansive and exhaustive Synthesis Report in 2022. But there is an important moment in this text, almost hidden amongst the full report's 4,000 pages, in which the working group points out that “the rate, scale, and magnitude of anthropogenic changes in the climate system since the mid-twentieth century” will have profound effects on ecological relations. These “anthropogenic changes,” the authors write, are triggering “chemical and biological changes in the Earth system such as rapid ocean acidification due to uptake of anthropogenic carbon dioxide, massive destruction of tropical forests, a worldwide loss of biodiversity and the sixth mass extinction of species” (Chen et al. 2021, 161). In a word, then, the climate crisis precipitates a biodiversity crisis.

2

Tuesday 10 August. The conservation website *Mongabay* runs a profile of the buffy-headed marmoset (*Callithrix flaviceps*), a kitten-sized fungus-eating primate of Brazil's Atlantic Forest (Hance 2021). The marmosets are struggling. Reportedly down to just 2,500 individuals, they are now listed as critically endangered by the International Union for the Conservation of Nature (IUCN). The reasons for their decline? Climate change, deforestation, and the ravages of yellow fever; but also, and crucially, the exotic pet trade. Not that the buffy-headed marmosets are themselves prized species for trading and pet-keeping. Rather, it is the other marmoset species—like the common and black-tufted-ear marmoset—that are frequently captured, sedated with alcohol, taken to markets, and sold to unsuspecting customers who only later realize that these are distressed and displaced wild beings, not docile, domesticated pets. Shocked, people release the angry marmosets into nearby forests. As the freed marmosets mingle with their buffy-headed cousins, their contact intensified by the forest's shrinking land-mass, they set in motion processes of genetic hybridization that breed out the distinctive features of both species. Conservationists warn that, without the intervention of captive-breeding programs, the buffy-headed marmoset will vanish in just a few generations. This is why Vanda Felbab-Brown describes wildlife trafficking as an “extinction market” (2017, 8)—not only are the exotic pet trade's systems of value predicated on extinction and endangerment as forms of scarcity, but its everyday reproduction as an informal supply chain also accelerates extinctions elsewhere, down the line and out of clear sight.

The buffy-headed marmoset's decline is symptomatic of what the IPCC describes above as “a worldwide loss of biodiversity and the sixth mass extinction of species.” This is the theory that our planet is currently experiencing a staggering drop-off in biological diversity—of fungal, plant, and animal wildlife—in relation to the Earth's geological time (O'Key 2023, 169). To wrap our heads around this idea, though, we must first understand the two primary ways in which extinction concomitantly animates and deanimates life. First, undergirding all biotic processes on Earth is a ‘natural’ rate of species loss. This endemic ‘background’ rate is thought to be integral for new speciations, the unmaking and re-making of lifeways (Jablonski 1986, 129; Wang 2003, 455). Second, the Earth has experienced five major spikes in extinction over the past half a billion years, five mass extinction events in which planetary processes transformed quicker than species could adapt. What unites these five great die-offs is that they are all fundamentally natural or incidental. Predating *Homo sapiens*, they were

caused by intrinsic Earth processes (rises in oxygen levels, toxic algae blooms) and exogenous shocks, like the asteroid that cascaded into the Earth's surface 66 million years ago (Alvarez et al. 1980). The age of complex evolutionary life on Earth is also the age of extinction.

But since the 1980s, more and more scientists have sounded the alarm over a new global crisis in biodiversity (Sepkoski 2020, 3). In the 1990s, E. O. Wilson and then Richard Leakey and Roger Lewin first started describing this as the "Sixth Extinction" (Wilson 1992, 32; Leakey and Lewin 1995, 232), a term that has since been popularized by Elizabeth Kolbert's Pulitzer Prize-winning 2014 book of the same name. The term suggests a continuation of the Earth's previous catastrophic events, but at the same time it denotes a distortion, perhaps even a breaking, of the idea of 'extinction' itself. That's because the reasons for this mass extinction event are not, as before, incidental but, rather, systematized social decisions and actions that, by reorganizing the wild directly and indirectly, culminate in atmospheric and ecological upheavals. The Intergovernmental Platform on Biodiversity and Ecosystem Services writes that, due to what it euphemistically calls "human-induced changes" such as habitat reduction, climate change, monocropping, and over-fishing, biodiversity is now "declining faster than at any time in human history" (IPBES 2019, 10). Our World in Data puts it that, if the current estimates on biodiversity loss are accurate, then "we're not only losing species at a much faster rate than we'd expect, we're losing them tens to thousands of times faster than the rare mass extinction events in Earth's history" (Ritchie and Roser 2021). Such distress signals pertain only to what is currently known and measurable to science. A mid-to-low estimate suggests that there are around 8 million species on earth; yet only 2 million of these are officially recorded. Today's conservation red lists, classificatory adjustments, and extinction announcements are thus no more than the tip of the extinction iceberg (Purvis n.d.). What is known about the Sixth Extinction, then, is that it concerns the loss of what remains unknown. It names the loss not just of charismatic species like the buffy-headed marmoset but also the continents of unrecorded and unrecognized critters who each play their role in shaping planetary life.

3

Wednesday 11 August. For decades, Sierra Nevada's red foxes have suffered from the combined impacts of poisoning, trapping, and habitat loss due to logging and livestock grazing. Yet now, after years of campaigning by conservation and environmental activists, the red fox has been formally

recognized as endangered by the US Fish and Wildlife Service. In another part of the world, a new study explains that, if the Antarctic sea ice continues to melt, emperor penguin colonies will become quasi-extinct by the end of the century (Jenouvrier et al. 2021).

Are these two events truly part of the same story of planetary de-wilding? Do they really constitute a mass extinction event in the technical sense of the term? Some scientists think not. David Jablonski, for instance, cautions that just because we are witnessing an intensification of the estimated natural background rate of species loss, this does not necessarily mean that we are entering an entirely distinct “macroevolutionary regime” in geological history (Jablonski 1986, 129; see also Raup and Sepkoski 1982). Elsewhere, David Sepkoski (2020) observes that the current calculations of global species decline may ultimately depend on and extrapolate from an estimated background rate that has itself been called into question for its small sample size (222, 269). If the natural background rate is unrepresentative, then how are we to assess the severity of the current spike?

Plus, there is no easy way to date the beginning of the Sixth Extinction. Just like the continuing debates on the Anthropocene and the Capitalocene, it remains an open question as to when the processes of global deforestation and defaunation really began: some would argue that it began with the invention of tool use, which catapulted *Homo sapiens* proper to the apex of the food chain; or with the new agricultures and sedentary food production methods of pre-industrial settled societies; or with the European conquest of the Americas and the inception of colonialism; or with the Industrial Revolution, the formal development of a modern capitalist political economy, and the widespread transition from ‘formal’ to ‘real’ subsumption, as new technologies made possible a thoroughgoing mastery of what was once wild (Vettese 2020).

Just like the concept of the Anthropocene, then, the Sixth Extinction has two lives, “a scientific life involving measurements and debates among qualified scientists, and a more popular life as a moral-political issue” (Chakrabarty 2021, 158). Where critics ultimately draw the line and declare the tipping point depends as much, if not more, on their strategic ideological disposition than on any scientific findings themselves. But wherever we end up dating the inception of the Sixth Extinction—two, five, or ten centuries ago—the fact remains that the global biodiversity crisis has worsened significantly since the Second World War, in the aftermath of the period known as the ‘great acceleration.’ The great acceleration saw an exponential increase in primary energy and fertilizer usage, urban populations and consumer goods, real GDP, international transportation and logistics networks, and far-reaching land-use changes that have become

the leading cause of habitat loss (Steffen, Crutzen, and McNeill 2007). According to the World Wide Fund for Nature and the Zoological Society of London, there has been “an average 68 % decrease in population sizes of mammals, birds, amphibians, reptiles and fish between 1970 and 2016” (WWF 2020, 6). There is little argument among researchers that something profound is happening. “What most observers seem to agree on,” Sepkoski writes, “is that we have, in fact, crossed a threshold in which species loss and climate change have reached irreversible proportions” (2020, 232).

The Sixth Extinction thus remains useful as a concept because it names a *historical* extinction event or, better, a *natural–historical extinction*: an unnatural rendering of a previously natural event, a social and economic articulation of an organic process, in which some people’s decisions about how to live in the world have required a significant reorganization of nature and depletion of the wild. Rather than simply indicating a continuation with the Earth’s prior extinction events, then, the Sixth Extinction designates the first socially produced global unravelling of ecologies. It stands as a comparative term, one that helps make sense of modernity’s impacts on the planet through an analogy to the five previous natural disasters that once strangled the Earth. The scientific literature suggests to us that modernity has been like an asteroid smashing into the planet’s surface.

4

Thursday 19 August. India is home to numerous vulture species: the slender-billed, the white-rumped, the long-billed, and more. Or at least it *was*. The Bombay Natural History Society estimates that, in the 1990s, during India’s economic liberalization under the premiership of the neoliberal reformist P.V. Narasimha Rao, the country’s Gyps vulture populations plummeted by up to 97 percent (Swan et al. 2006). When biologists closely observed the ailing birds, asking why it was that the vultures’ heads were bowed and their postures slumped, their early hypotheses pointed to a novel infectious disease or the ingestion of environmental pollutants—pesticides, herbicides, and toxic metals. But the breakthrough came when researchers identified that an industrial veterinary painkiller used on livestock, the non-steroidal anti-inflammatory drug diclofenac, had links to visceral gout and kidney failure in bird populations.

Across the Indian subcontinent, hundreds of millions of cows and buffaloes are bred for their dairy, meat, and hides and trained to pull ploughs and carts (Narayanan 2023, 15–16). Annually, India raises more livestock

than any other country except China (McGrath 2007). But because cows are sacred animals, traditional practices meant that typically cows were not slaughtered but instead allowed to die ‘naturally,’ their lifeless bodies eventually taken to huge dump sites or the edges of villages and towns. There, the carcasses became the principal food source of vulture flocks. In just half an hour, a wake of 100 vultures can crowd round a cow carcass and strip it clean (McGrath 2007). It is widely understood that vultures occupy an important ecological role in Southeast Asia: in their feasting they produce clean bones for fertilizer, limit feral dog and rat populations, and act as buffers for the possible spread of pathogens from cow to dog to human.

This socio-ecological network of human—cow production and vulture—cow consumption was intensified during the so-called ‘livestock revolution’ of the 1980s and 90s. This was a period of rapid worldwide increase in the mass consumption and production of livestock, a feature of the great acceleration, in which cattle farming in historically low-income societies like India became more extensive, more centralized, and more technologized. The term ‘livestock revolution’ was coined by the UN’s International Food Policy Research Institute to explain the links between the increasing urbanization, population growth, and rising per capita incomes of developing nations like Brazil, China, and India on the one side, and the apparent demand-driven growth in livestock production on the other (Delgado et al. 2001). The livestock revolution was underpinned by structural transformations in global food supply chains, including the conglomeration of companies, the global integration of markets, increased subsidies by national governments, logistics coordination, and export-led industrialization. Part of what Mike Davis has called the “larger world conquest of agriculture by large-scale agro-capitalism” (Davis 2005, 155), the livestock revolution has, as might be expected, numerous adverse consequences for global agriculture, public health, individual livelihoods, and the wider environment.

In India in the 1990s, not only were more cows now being bred but their lives were being micro-managed to increase the efficiency and volume of production. One such measure was the application of diclofenac, a painkiller used up and down the country to medicate dairy cows against the everyday discomforts of being farmed. The result? That between the early 1980s and late 1990s, per-capita total milk consumption in India almost doubled (Khan and Bidabadi 2004, 108). India’s booming dairy sector became increasingly predicated, Yamini Narayanan argues, “on the cyclical slaughter of ‘surplus’ cows, bulls, buffaloes, and calves” (2023, 46), so much so that, today, India stands as the world’s leading exporter of cow meat, despite boasting that it rears no cows specifically for beef. Cows

are legally protected by constitutional articles and strict federal laws; cow slaughter is formally penalized by imprisonment and informally punished by politicized cow vigilantes. Across the country, thousands of shelters, or *gaushala*, purport to usher older and abandoned dairy cows towards a 'natural' death; yet there is also a system of small-scale abattoirs that ignores the country's official cow devotion, recycling the discards of the dairy industry to produce beef for the global meat market.

There is, though, an environmental catch. Dairy carcasses thrown to the vultures were laced with high-levels of diclofenac. When the vultures came to scavenge on the piles of dairy cow bodies, therefore, they were eating contaminated meat (van Dooren 2014, 46). Their numbers plummeted. The near-extinction of vultures is thus a cost of the livestock revolution, the result of industrialized cow slaughter, dairy production, and food poisoning. Since this discovery, a coalition of scientific and advocacy groups have sought to prevent the vultures' extinction. They have argued that, because vultures help to prevent zoonotic spillover, their sudden decline—one of the fastest collapses of bird populations ever recorded—is a concern for public health as much as it is biodiversity conservation. In 2006, campaigners won a hard-fought victory in the Indian courts, securing a nationwide ban on the veterinary sale of diclofenac. Yet, 15 years later, researchers would discover that diclofenac remains not just in use but prevalent throughout India, accounting for up to 46 percent of all livestock anti-inflammatories in circulation (Galligan et al. 2021). Scientists continue to petition for diclofenac's complete prohibition, as well as the banning of other drugs, such as aceclofenac, ketoprofen, and nimesulide, that are still free to use on livestock and have also been proven to harm vultures (Nambirajan et al. 2021). And they continue to run managed captive breeding programmes for vultures across the country, which are slowly reintroducing vultures back into the semi-wild protected areas of nature reserves. Today, after two decades of work, conservationists in West Bengal are releasing eight more captive-bred white-rumped vultures into the wild (Ayyar 2021).

5

Thus far in this contribution, I have focused my analysis primarily on the scientific understanding of extinction. In Part 1, I situated the current worldwide loss of biodiversity within the context of the planetary crisis of climate change. Then, in Part 2, I explained the concepts of 'extinction' and 'mass extinction' before juxtaposing them with the recent development of

the 'Sixth Extinction' thesis. Part 3 problematized this very idea, explaining how the scientific bases for calculating the Sixth Extinction—such as the natural background rate, the current spike in rates, and its date of inception—remain heavily debated. But with a keen awareness of the cultural circulation of 'extinction' as a concept, I then suggested that the idea of the 'Sixth Extinction' is ultimately as much an ethical and political question as it is a technical-scientific one. What matters is not, in the final analysis, whether we truly are living through a totally new macroevolutionary regime of species loss, but whether there is a clear, evidenced global decline in biodiversity. Because this is the case, it becomes both morally and strategically advantageous to make use of the 'Sixth Extinction.' Part 3 therefore emphasized the need to scrutinize, yet also hold onto, the idea of the Sixth Extinction as an explanatory tool and politically strategic phrase.

In Part 4, I turned to the Indian subcontinent, examining the rapid decline of vulture species across the past two decades, suggesting that this event can be understood as an ongoing example of the Sixth Extinction. The story of India's critically endangered Gyps vultures makes for a compelling and complicated test case when thinking, as this book does, about the relationship between science, culture, and the postcolonial. For one of the crucial things that this story highlights is how the postcolonial state's nation-building and developmentalism—its modernization through uneven development—goes hand-in-hand with socio-ecological upheavals that dramatically alter and impoverish long-standing ecosystems. Here, the administration of painkilling drugs to cows in the name of greater efficiency and higher volumes in dairy production—a national staple for modernization but also part of a wider trend in global animal agriculture in late capitalism—can be understood as the undoing of an interspecies settlement.

But what I haven't yet done is connect these thoughts on science, culture, and postcoloniality to the role, or problem, of narrative. Or at least, I haven't done so directly. Throughout this essay, I have been writing in a deliberate style and tone, one which seeks to mediate scientific knowledge while also placing something of myself—my own experiences while crafting this chapter—into the construction and argumentation of the text. With each preceding section, beginning as they do with dispatches from the frontlines of extinction, I have wanted to stay true to the conjuncture in which I write, to construct an essay on extinction in light of the continual stream of information that shapes my perspective on global biodiversity loss. What I have been attempting to do in these pages, therefore, is to express something of my own personal relationship to extinction at the very moment in which I am writing about it professionally. And if

this experiment has been at all successful, if the reader is still here now, following this sentence, then perhaps this is a testament to the uniquely compelling work of narration itself.

This essay's attempt to narrate extinction has been informed by extinction studies, a growing field of environmental humanities research that, in its commitment to interrogating "the plural phenomena and entangled significance of extinction" (Chrulew and De Vos 2019, 24), argues that the endangerment of one species marks a process of collective loss, an undoing of co-evolutionary networks and intergenerational lineages. Extinction studies essays are often written in a meditative first-person style that combines analysis and affect, science and culture, the objective and the subjective. Balancing the introspective anecdote with academic citations, essays in extinction studies aspire above all to a form of storytelling that can, in their words, "bear witness" to the Sixth Extinction (van Dooren and Rose 2016, 89). Scholars like Thom van Dooren and Deborah Bird Rose have argued that it is through storytelling—thought of as a kind of ecological witnessing and articulated attentiveness—that readers can be drawn into new connections with and responsibilities to the world.

Yet this essay also emerges out of a methodological and literary-critical frustration with extinction studies' conception of storytelling: first, because it risks uncritically privileging storytelling as a site of individual ethical development, measuring the adequacy of our response to mass extinction in terms of our personal feeling for it; and second, because it leaves undertheorized the question of narrative itself as a fundamentally *literary* act. This is why, in the final part of this chapter, I will turn towards fiction itself. By exploring the work of literary narrative, and doing so *through* the work of interpretation—that is, the analytical re-narration of literary narration itself—I will ultimately focus on how fiction can critically engage with the Sixth Extinction. Yet the text I have chosen to focus on here does not valorize storytelling as a commensurate response to extinction, as extinction studies does. It instead thematizes its own inadequacies, declining to privilege the story as an ethical answer to biodiversity loss.

6

So how might one articulate, within literature, the plight of India's vultures? Which modes of description, which forms and styles, can be harnessed in order to express the social processes behind biodiversity loss? To reformulate this in more general terms: how might writers write the Sixth Extinction? And in what ways do postcolonial literary works in particular

grapple with the rapid, sociogenic extinction of our fellow creatures? I wish to approach this problem by homing in on just one text, one recent postcolonial novel that, through its specific articulation of the Sixth Extinction, offers a complex example of the combination of science and postcolonial narratives. I am speaking here of Arundhati Roy's much-anticipated second novel, *The Ministry of Utmost Happiness* (2017).

In what follows, I will perform a close reading that concentrates especially on *The Ministry's* opening page, arguing that this is a novel that is fundamentally *framed* by the Sixth Extinction. I will reveal how the text's plotted action takes place, and its wider thematics are situated, in a world typified by and cast in the shadow of the sudden socially produced decline of India's vultures. *The Ministry* is located, to put this in Roy's own words, in a place "where old birds go to die" (Roy 2017, 3). Throughout my analysis, I will suggest that the novel bears witness to species extinctions as a symptom of India's contemporary political situation. Roy's novel dramatizes the new political alliance between neoliberalism and Hindu nationalism, challenging both from a decidedly environmental perspective.

Let me begin by noting that, looked at on the surface, *The Ministry* is by no means a novel that appears preoccupied with mass extinction. Addressed at the outset to "the Unconsoled," *The Ministry* is principally concerned with the "price for Progress" (Roy 2017, 99) in an India that, since the Bharatiya Janata Party (BJP)'s electoral victory in 2014, has been under the thumb of right-wing strongman Narendra Modi. The BJP's authoritarian nationalism sees India as what Banu Subramanian calls an "archaic modernity": "rather than characterize Hinduism as ancient, nonmodern, or traditional, the Hindu nationalists have embraced capitalism, Western science, and technology as elements of a modern, Hindu nation" (Subramanian 2019, 7). Modi's majoritarian state is built out of the amalgamation of "national pride and long-held aspirations of the global recognition of India as a world power" (Chatterji et al. 2019, 11). *The Ministry* responds, through the resources of fiction, to this conjuncture of Indian politics; its major plot points revolve around the marginalized and outcast subjectivities of contemporary India, the state's authoritarian turn, the ongoing military occupation of Kashmir, and the widespread political embrace of capitalist-industrial modernity.

But the novel also has an inarguable environmental consciousness, as one might expect from Roy, who has spent the almost two decades since the publication of *The God of Small Things* writing about the interrelation between social movements and environmental issues and advocating on behalf of those communities dispossessed by dam-building projects. Roy portrays India, and Delhi in particular, as undergoing a rapid

American-style industrialization in which landscapes and ecosystems are dramatically remade and commodified. All that is solid melts into air as factories replace forests and spring water is packaged up for sale:

Skyscrapers and steel factories sprang up where forests used to be, rivers were bottled and sold in supermarkets, fish were tinned, mountains mined and turned into shining missiles. Massive dams lit up the cities like Christmas trees. Everyone was happy.

Away from the lights and advertisements, villages were being emptied. Cities too. Millions of people were being moved, but nobody knew where to. (Roy 2017, 98)

By addressing her novel to the “Unconsoled,” then, Roy nods—as I have written elsewhere (O'Key 2022, 167)—to the losers of neoliberal globalization: to the capital city's poorest, whose homes are flattened by bulldozers imported from Australia, and to the environment itself, now leaden with the “smog and mechanical hum of the city” (101).

Roy's writing has frequently been read in line with the theories of an ‘environmentalism of the poor.’ As Pablo Mukherjee points out in *Postcolonial Environments* (Mukherjee 2010, 82), Roy cultivates a kind of humanism from below, which, by focusing on the contemporary displacements and dispossessions of tribal, peasant, and proletarianized peoples, suggests a deep continuity between the postcolonial present and the imperial past. The quotation above certainly appears to endorse such a reading. When Roy writes that “millions of people were being moved, but nobody knew where to” (2017, 98), she trains her attention on both a new population of internally displaced refugees and the naïve citizens of the polis who remain unaware, a ‘nobody’ who are also the country's politically recognized somebodies.

Yet in *The Ministry*, Roy's humanism also extends, in concrete and meaningful ways, to other species. When Tilo, one of the novel's two main characters, tours the smog-hazed city, she is struck by a spectacle of horrors at the busy zoo. Visitors throw litter into enclosures. A Bornean gibbon clings on to a tree “as though his life depended on it.” A hippo swims in a “scummy pond” full of plastic bottles, empty cigarette packets, and razor blades flicked by a “knot of noisy young men.” The zoo claims to house a number of exotic snakes, sambar deer, and a Siberian tiger, but these animals are nowhere to be seen. “Most of the birds in the aviary were ones you could see on the trees anyway. Bird scam,” Tilo thinks, the word “scam” hinting at a link between the corruption of India's political classes and its wildlife industries (234–35). Within this India, Tilo intimates, nature is

being enclosed and then sold back to the citizen in bottles, tin cans, and zoo cages.

Later, Tilo considers how farmed animals are becoming genetically modified and turned into living factories. Pigs given growth hormones can no longer bear their own weight, “so heavy that [they] cannot stand up” (299). Gigantic trout require more feed than ever before. Tilo scoffs: “But perhaps this is the path to genuine modernity?” (299). Roy maintains this ironic tone as Tilo reflects on the poultry industry’s attempts “to excise the mothering instinct in hens [...] Their goal, apparently, is to stop chickens wasting time on unnecessary things and thereby to increase the efficiency of egg production.” Tilo wonders whether this efficiency-saving business model will be applied to the grief-stricken Maaji, “The Mothers of the Disappeared in Kashmir,” who live—in the eyes of the prevailing ideology—as “inefficient, unproductive units, living on a mandatory diet of hopeless hope” (299–300). Here, Roy thematically joins together the battery-farming of India’s hens with the anguish of Kashmiri mothers. The upshot is that the novel suggests that the work of care—performed by human and animal alike—is not cared for as work, that it sits in contradiction to the machinations of commodification and military occupation.

Upon its publication in 2017, *The Ministry* was met with lukewarm reviews. Roy’s critics were, in the main, left unconvinced by her novel’s length, polyphony, non-synchronism, episodic emplotment, authorial digressions, and diverse cast of minor characters (see Massie 2017 for an exemplary reaction). However, as Lorna Burns and Romy Rajan have each separately pointed out (2019, 134; 2021, 93), the novel’s sheer scale is a deliberate choice, an attempt to gather together a variety of stories, characters, and literary techniques whose sheer multiplicity would register at once the heterogeneity of the Indian nation itself *and* its historically specific disintegration “as the saffron tide of Hindu Nationalism rises in our country like the swastika once did in another” (Roy 2017, 165). One might read *The Ministry*’s self-consciously fragmentary style and polyphonic social panorama, then, as formal challenges to the ideologies of unity and authenticity circulated under the aegis of authoritarian Hindu nationalism. Or we might even say that, because Hindutva’s fascistic promise of an undivided India is, in fact, premised on a further fragmentation of extant inequalities and grievances—the restriction of Muslim citizenship, the extension of police powers, deepening economic deprivation, worsening political disenfranchisement, and the incitement of communal violence—Roy’s novel strives for a form of counter-fragmentation.

Yet this picture is complicated by the many ways in which Roy’s novel also casts doubt on its own abilities, even emphasizing its failure, as

literature, to face up to the very crises it portrays. "I would like to write one of those sophisticated stories in which even though nothing much happens there's lots to write about," Tilo writes in a notebook. However: "That can't be done in Kashmir. It's not sophisticated, what happens here. There's too much blood for good literature" (283). In response to this passage, Filippo Menozzi has stressed that Roy, who published *The Ministry* after two decades of committed journalism and activism, is here directly concerned with fiction's "inability to represent a reality of suffering in full, and to right the wrongs being done in the real world" (2019, 201). This does not mean that Roy is rejecting literary narration as such. As Graham Huggan reminds us, even Roy's journalism and nonfictional essays often undermine their own "best arguments by drawing attention to [the prose] itself as a playful piece of highly literary investigative writing" (2004, 709). Just as Roy's nonfiction is informed by the literary, so too are her fictional works informed by a critical register. *The Ministry*, therefore, does not relinquish fictional modes of representation. Rather, it is a work that folds its suspicions of fictional writing—of aestheticizing violence into the digestibility and marketability of 'good literature'—into its very formal composition.

What Roy seems to be asking, then, is "How to tell a shattered story?" as she writes in the novel's final act; that is, how might a novel narrate Hindutva's shattering of an already shattered society? Roy has Tilo offer this answer: "By slowly becoming everybody. No. By slowly becoming everything" (436). We can read this as a meta-textual theorization of the novel's own formal style, in which "becoming everything" signals a narrative formalization of a panoramic and vertiginous standpoint, a systemic angle that maps space, surveys time, and follows the money. Roy's search for an 'everything' perspective begins from the novel's very first page. Here, she offers a short, scene-setting opening paragraph, typeset in italics, which functions as a preface for the novel that is due to unfold:

At magic hour, when the sun has gone but the light has not, armies of flying foxes unHINGE themselves from the Banyan trees in the old graveyard and drift across the city like smoke. When the bats leave, the crows come home. Not all the din of their homecoming fills the silence left by the sparrows that have gone missing, and the old white-backed vultures, custodians of the dead for more than a hundred million years, that have been wiped out. (Roy 2017, 1)

Roy tracks an ecological-industrial chain reaction, turning what begins as a sunset ceremony of urban wildlife (flying foxes, Banyan trees, bats,

crows) into a kind of witness statement to the extinction of vultures. The “custodians of the dead” are themselves being “wiped out.” The paragraph continues:

The vultures died of diclofenac poisoning. Diclofenac, cow-aspirin, given to cattle as a muscle relaxant, to ease pain and increase the production of milk, works—worked—like nerve gas on white-backed vultures. Each chemically relaxed, milk-producing cow or buffalo that died became poisoned vulture-bait. As cattle turned into better dairy machines, as the city ate more ice cream, butterscotch-crunch, nutty-buddy and chocolate chip, as it drank more mango milkshake, vultures’ necks began to droop as though they were tired and simply couldn’t stay awake. Silver beards of saliva dripped from their beaks, and one by one they tumbled off their branches, dead. Not many noticed the passing of the friendly old birds. There was so much else to look forward to. (Roy 2017, 1)

We move, then, from the artificially stimulated production of milk to the chemical poisoning of white-backed vultures. Through the paratactic repetition of the conjunction “as,” Roy suggests that the forces of mass production and mass consumption are temporally and causally paralleled with extinction: the city functions, *en masse*, as an anthropomorphized “it” that acts on a scale far larger than the individual consumer. Roy thus begins *The Ministry* by mapping the ways in which the livestock revolution, as part of India’s economic liberalization, hastens the Sixth Extinction. The novel’s narrative form, of “becoming everything,” thus glimpses the totality of sociogenic extinction. Through the present-to-past narrative temporality of the verbs “works—worked,” Roy moves from life to death. Cows and white-backed vultures are dying so that the city’s consumers can munch their way through dairy products.


The Ministry’s opening fragment ends by stating that “not many noticed the passing of the friendly old birds. There was so much else to look forward to.” How are we to read this? As further evidence of how the consumerist promises of a modernizing India (“more ice cream, butterscotch-crunch, nutty-buddy and chocolate chip”) distract from its material destruction of ecological relations? Or perhaps this is Roy teasing her readers who, hungry for the first work of fiction in two decades by the Booker Prize-winning novelist, may be eager for this vulture vignette to end so that the novel proper can begin? Is it important, then, that the vultures’ ending stands as the novel’s beginning? That Roy situates her text in the liminal “magic hour” between a world of vultures and no vultures? The novel we read is framed by this “passing” of endangered life, and as the reader moves through the book they are invited to make an association between

the vultures and Roy's protagonist, Anjum, a transgender woman, or *Hijra*, an outcast who also lives in the graveyard, who struggles and persists in a society that consistently rejects her. Anjum and the vultures, then: old birds out of time and out of place, marginal and late figures living on the peripheries of a society that barely notices them.

Many people may have ignored the vultures' passing, Roy says. So she elects to be the one who notices, calling on her readers to notice with her. In doing so, she hints at vultures' important cultural and symbolic roles. They are "custodians of the dead" in the web of life, not just because they perch on trees above the graves but because, when they feast on carcasses, they convert lifeless bodies into new liveliness. By eating dead flesh they safeguard the souls of fallen animals. Who else will be able to turn death into life, Roy's opening fragment asks, when these creatures are gone? And who will shoulder the memory of the white-backed vultures now that they are caught in the extinction vortex?

Writing the Sixth Extinction thus means, in the first instance, *noticing it*. This is precisely what Roy does in *The Ministry*, a novel which, in its very noticing, articulates the structural links between society and environment, between humans and cows and vultures, and, thus, between mass consumption and mass extinction. At the same time, though, Roy refuses to romanticize the act of noticing. The end result is a work of postcolonial literature that ironically casts doubt on its own abilities to bear witness, that claims little more than a weak, or limited, narrative intervention. This formalized weakness becomes part of the novel's realism, meant in that doubled sense of a literary mode and a knowing, even cynical, pragmatism. Roy's return to fiction is thus full of ambivalence, complications, and messiness. And it is in this sense of an internal dissonance—a refusal to privilege storytelling as an ethical response, yet a commitment to storytelling nevertheless—that *The Ministry* fashions its own specific postcolonial negotiation of the Sixth Extinction: as custodian of the dead and dying.

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**TOWARDS
POSTCOLONIAL
LITERATURE AND
SCIENCE STUDIES**

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“They Were All Blondes”: Intersections of Racism, Feminism, and Eugenics in Mary Bradley Lane’s *Mizora*

ABSTRACT This chapter will read Mary Bradley Lane’s largely unknown proto-feminist utopia *Mizora* (1881) with a specific focus on how the novel reflects notions of racial and moral purity, both of which are apparently portrayed as signifying social progress—a progress which eventually eliminates the male part of the human population. To situate the novel in its socio-political and cultural context, this interplay of different notions of purity will be read in the light of gendered readings of human evolution in the wake of Charles Darwin, where writers such as Eliza Burt Gamble or Charlotte Perkins Gilman envisage the female of the species as the primary and more perfect of the human sexes. Linking such ‘purification’ of humankind with Angelique Richardson’s notion of ‘eugenic feminism’ (2003), this article investigates how the ideals of Mizoran society as presented by Lane show that a proto-feminist, perfectly female utopia is inevitably accompanied by ideas of social and ethnic purity, all of which find their apotheosis in the all-blonde, all-female society in *Mizora*.

KEYWORDS eugenics, feminism, matriarchy, racism, utopia

In 1915, Charlotte Perkins Gilman published the serial novel *Herland* in her own monthly magazine *The Forerunner*. Only available in book form since 1979, the book has been widely hailed as a touchstone in feminist utopian fiction. *Herland* chronicles the adventures of three male explorers in a hitherto-unknown country populated exclusively by women and provides an account of the social, political, and cultural results of this unusual state of an all-female and, crucially for this article, all-white society. Gilman clearly frames the emergence of this matriarchal society in the context of Darwinian evolutionary theory, as is demonstrated by this report, which

Van, the novel's first-person narrator, gives about the world the three men come from:

I explained that the laws of nature require a struggle for existence, and that in the struggle the fittest survive, and the unfit perish. In our economic struggle, I continued, there was always plenty of opportunity for the fittest to reach the top, which they did, in great numbers, particularly in our country; that where there was severe economic pressure the lowest classes of course felt it the worst, and that among the poorest of all the women were driven into the labor market by necessity. (Gilman 2009, 63)

Van's report connects the biological issue of evolution, as a law of nature, with differentiations of gender and social and economic participation. His social Darwinist narrative, which unmistakably channels Thomas Huxley's famous dictum of the "struggle for existence—the war of each against all" (1895, 206), is contrasted with the peacefully egalitarian sisterhood prevalent in Herland, a country with "no kings, and no priests, and no aristocracies," where growth is achieved "not by competition, but by united action" (Gilman 2009, 61). When Moadine, who acts as a tutor to the male explorers, explains to her astounded visitors that the peace and stability of her country's society rests solely on "the literal sisterhood of our origin, and the far higher and deeper union of our social growth" (67), Gilman undoubtedly invites her readers to understand Herland society as the result of a melioristic development towards a post-Darwinian society without struggle, violence, and hierarchies; a society which exhibits a marked influence of Peter Kropotkin's notion of 'mutual aid' as the main factor in evolution (2006).¹

Gilman's vision of this apparently perfectly egalitarian and serenely enlightened culture of sisterly love, which—in Jennifer Hudak's words—is "representative of the ultimate progression of humankind through evolution" (2010, 463), is, however, motivated by and conditional on what Michael J. Monahan calls a "politics of purity" (2011, 77), a systematic regime of social engineering which strives towards the elimination of sexual and also—this will be the salient point for my investigation—racial difference. The biological foundation and scientific justification for the "new race" of superwomen that inhabits Herland (58) is parthenogenesis, i.e. the ability of organisms to reproduce asexually, an ability which was acquired by the founding mothers of Herland after the men of the country were killed as

1 For a comprehensive overview of Kropotkin's influence on both Gilman and Lane, see Fisher (2014).

a consequence of internal warfare. Referring to these mythological foremothers, Van relates that they "were tall, strong, healthy, and beautiful as a race" (78), and this health and beauty is the result, so the novel clearly suggests, of a corporeal as well as moral process of purification, with the practice of parthenogenesis guaranteeing that both body and mind remain unblemished by the vicissitudes and imponderabilities of actual sexual intercourse. It is, however, not only sexual purity that characterizes the matriarchal society of Herland. Early on, the readers are informed that "these people were of Aryan stock, and were once in contact with the best civilization of the old world" (55), demonstrating both the racial (in this case, white Anglo-European) homogeneity of the Herlanders and the moral superiority derived from this uniformity. Van, who, as a trained sociologist, is acutely aware of the potential societal implications of biological principles, is not slow in drawing the conclusion that the maintenance and continuation of this kind of community needs to be based on eugenic principles, as "those held unfit [for motherhood; W. F.] are not allowed even that; and that to be encouraged to bear more than one child is the very highest reward and honor in the power of the state" (70). To sum up this admittedly very cursory introduction to *Herland*, we must acknowledge that the proto-feminist utopia of female rule and sisterly unity imagined by Gilman is founded on a rejection of corporeality and sexuality on the one hand, and, on the other hand, on a conception of racial uniformity and pure whiteness, as well as strict measures of eugenic social engineering by which this purity is accomplished. Bernice L. Hausman elegantly recapitulates and evaluates this embeddedness of (female) virtue in racist and classist fantasies of white supremacy by claiming that, in *Herland*, "eugenicist ideology surfaces in relation to maternal fitness rather than racial difference, although the suggestion of an Aryan race reminds the reader of the linkage of eugenics to ideas concerning race purity" (1998, 499).

In this article, I want to transfer the examination of this embeddedness and interconnection between female evolution, racial purity, and population control in the form of eugenics to another text, one which does not enjoy the canonical status of *Herland* but which serves as a pertinent counterpoint to Gilman's novel: Mary Bradley Lane's *Mizora*, a novel published 30 years before *Herland*, which likewise portrays a society consisting entirely of white women, who, in the name of scientific and biological progress, have established a community devoid of competition and struggle. Juxtaposing these two utopian narratives, I will argue that *Mizora* offers a more nuanced analysis of the complicated nexus of science and ethics in the colonial encounter and imagination than *Herland*, at times even challenging the conventional gender ascription of the male explorer and

conqueror. While not altogether managing to escape the colonial politics of purity, Lane's novel still exhibits a level of (post-colonial) scientifically informed self-reflectivity, a position from which it contemplates and reflects on a variety of significant socio-political and biological discourses of the day and the complex ways in which they are interrelated. In order to situate my comparison of the two texts within their scientific and cultural background, I will first briefly sketch some of the main contemporary scientific and sociological sources which feed into the emergence of what Angelique Richardson has termed "eugenic feminism" (2003), a notion I will subsequently attempt to triangulate with an enquiry into the racist connotation of Gilman's and Lane's utopian imagination that is based on Monahan's notion of a "politics of purity" (2011, 77). With a view to the overall topic of this volume, my contribution will attempt to read *Mizora* as an imaginative attempt to move beyond a binary understanding of science as either a progressive, liberating force or as a (willing or unwitting) instrument of Western imperialism by demonstrating how the emancipatory potential of science for improving society is entangled with an imperial politics of race.

The Ascent of Woman? A Short History of Gendered Evolution

In order to be able to place *Mizora* and *Herland* within this complex and contested field, it is first necessary to briefly provide a rough overview of the scientific and socio-political discourses against which both novels need to be read. Darwin had famously all but left out the human from his *The Origin of Species* (first published in 1859) and only came to address the consequence of his theories of natural and sexual selection for human society in *The Descent of Man* (1871). There, without probably very much actually meaning to do so, he sets the tone for a gendered reading of evolution which, arguably and to a certain degree, is still prevalent in our days. When he writes that certain human traits and powers are "more strongly marked in women than in man," that "these faculties are characteristic of the lower races, and therefore of a past and lower state of civilization" (Darwin 2004, 629), and that "[at] some future period, not very distant as measured by centuries, the civilised races of man will almost certainly exterminate, and replace, the savage races throughout the world" (183), he creates what could anachronistically be called an intersectional template which intricates gender difference and gendered hierarchies with questions of racial superiority.

This template is readily taken up by scientists and cultural theorists alike, as the following two particularly influential examples show: no-one has done more to rework Darwin's theories into tools for analysing, predicting, and regulating the behaviour and governance of human societies than Herbert Spencer. As part of this reworking, Spencer, in *The Psychology of the Sexes*, presents an 'explanation' for the evolved gender difference of human character dispositions in the simple fact of motherhood, which for him means that "only that mental energy is normally feminine which can coexist with the production and nursing of the due number of healthy children" (1874, 31), resulting in turn in "an arrest of individual development" in the female of the species (32). Spencer, it needs to be stressed, does not fully endorse this state of affairs but sees it, rather, as another interim stage in human development which needs to be and will eventually be overcome, suggesting that "as civilization readjusts men's natures to higher social requirements, there goes on a corresponding readjustment between the natures of men and women, tending in sundry respects to diminish their differences" (35). In other words, the elimination of—or at least a reduction in—gender difference can count, for Spencer, as a mark of social and ethical improvement. In *The Evolution of Sex*, one of the scientific bestsellers of the late nineteenth century and my second example, Patrick Geddes and Arthur Thomson supply the terminology for this dual economy of gendered human development: while men, "simply because they are males," are more active and generally "tend to live at a loss"—a mode they classify as *katabolic*—women, in contrast, are *anabolic*, with restraint and "constructive processes predominating in their life" (1889, 26).

While such readings of evolutionary gender differentiation, which take male development as the evolutionary standard and female development as arrested or defective, certainly constitute both the scientific and sociological mainstream of the day, alongside this mainstream exists another tendency, one which has only recently been recuperated academically and which is also very pertinent to reading *Mizora*.² A number of (mostly female) writers employ their reading of Darwin and, to a lesser extent, Spencer to make a case for, as Eliza Burt Gamble puts it in *The Evolution of Woman*, "the female as the primary unit of creation," whereas "the male functions simply supplemental or complementary" (1894, 31). Parthenogenesis, she argues in this context, proves her point that—from an evolutionary perspective—the male may occasionally be nice to have around but can, on the whole, be regarded as surplus to requirements and will, in

2 For detailed accounts of this alternative, proto-feminist interpretation of evolution, see Deutscher (2004), Vandermassen et al. (2005), and Hamlin (2014).

the fullness of time, find himself “weighted in the struggle for supremacy” (77). By uncoupling the evolutionary mandate of procreation from the biological fact of male–female sexual intercourse, parthenogenesis—as Thomas Galt Peyser notes—also “suggests that women’s bodies are or can be free from phallocentric law” (1992, 2).

Whereas Gamble, and other writers such as Antoinette Brown Blackwell or Francis Swiney, find in Darwinian evolution evidence for an innate female superiority, thus reversing the conventional gendered hierarchy which Darwin himself had helped to establish, there exists another strand of argument which uses evolution to argue for the irrelevance of gender difference altogether. Gilman herself is a pertinent case in point here, claiming as she does in *Women and Economics* that there is no such thing as sexual determinism and that any “arrested development” (1900, 330), meaningfully taking up Spencer’s phrase, is a consequence of the socio-economically underprivileged condition of woman in her times. Tellingly for the topic of this article, Gilman frames her analysis of female oppression in terms of racial improvement, which—in contradiction to Darwin’s view of evolution as essentially blind and non-teleological—she sees as the purpose and goal of human development: she claims that the “sexuo-economic relation has debarred her from the social activities in which, and in which alone, are developed the social virtues. She was not allowed to acquire the qualities needed in our racial advance” (329). Even though, in all likelihood, Gilman’s use of the term ‘race’ refers in this context to the entirety of the human species rather than any ethnologically defined subset, the very fact that its reference is unfixed and that it even “broadly encompasses both characteristics of sex and skin color” (Mahady 2004, 104) gives evidence of its versatility for the ideological implementation of structures of dominance and submission.

It is certainly no coincidence that Gilman links her narratives of female empowerment and equality with eugenic notions of social and racial improvement. In her study *Love and Eugenics in the Late Nineteenth Century*, Angelique Richardson pursues this connection and finds it so pervasive as to warrant its own critical category, ‘eugenic feminism,’ the objective of which she claims to be “the construction of civic motherhood which sought political recognition for reproductive labour” (2003, 9). In a nutshell, this connection is based on the notion that the existing patriarchal structures are so resilient that nature, on its own, will not be able to realize the potential of what Alfred Russel Wallace, co-discoverer of natural selection, calls “the cultivated minds and pure instincts of the Woman of the Future” (quoted in Richardson 2003, 55). Nature, therefore, is in need of human help in the form of regulating future society by way of controlling

and directing reproduction. Calling to mind Geddes and Thomson's dual economy of male and female gender dispositions as katabolic and anabolic, respectively, Richardson shows that within the context of eugenic feminism, "degeneration was a masculine narrative, while regeneration, which reversed its plot, was feminine" (52). That this plot reversal also bears profound consequences for the political sphere is evident from her assessment that "eugenic love was the politics of the state mapped onto bodies: the replacement of romance with the rational selection of a reproductive partner in order better to serve the state through breeding" (8–9). The argument here, by espousing "the vital contribution of women in regenerating the British imperial race" (xvii), integrates Gilman's and Spencer's notion that a revaluation of woman's role and status in society could, indeed, enhance the human condition in general with the colonial fantasy and politics of racial purity. According to Monahan, this fantasy is based on the "normative presumption [...] that any given individual ought to clearly and unambiguously be a member of one and only one racial category, and that each category will itself be discrete and self-contained" (2011, 77). This normative purity, I would suggest, figures as the nexus of the eugenic practice of mapping state politics onto bodies, implying, as it does, that both sexual and racial nonconformity need to be eradicated on the path towards realizing the supposed pinnacle of human evolution—the chaste, white Anglo-European, who "stands as a racially pure category at the pinnacle of social, cultural, and economic hierarchies" (84).

This glorification of sexual and racial purity in the name of science and human progress entails, of course, various configurations and strategies of exclusion and suppression, but also of empowerment and agency. On the one hand, it provides apparent scientific justification for the colonial project of conquest and subjugation of supposed 'lower races' and adds fuel to the fear of racial miscegenation insofar as "whiteness is understood as pure humanity [and] that the purity of whiteness must be protected" (Monahan 2011, 85). On the other hand, it lends itself equally well to being deployed in the service of female emancipation and participation. According to Jessica Walsh, for example, many feminists of the time "supported eugenics, since it offered an entry point for discussions of reproductive rights" while at the same time "encouraging the language of national pride so often employed by reformers campaigning against repressive and allegedly primitive laws and traditions" (2002, 219–20).³

3 In this context of the national and ethnic dimension of evolution and eugenics, Kimberley Hamlin recalls the notion of 'race suicide,' a term first used by Edward A. Ross in 1901, referring to "the idea that middle- and upper-class

The New Puritans: Race and Gender in *Mizora*

If all this remains a bit vague for the moment, I hope my reading of *Mizora* will provide some further explanation and illustration. The text, which Jean Pfaelzer has ennobled as “the first major work of utopian fiction in America” (2012, 323), was first published in serial form in the *Cincinnati Commercial*, and, as Murat Halstead, the editor of the full novel ten years later, would highlight, not much was—or is now—known about its author, Mary Bradley Lane. He merely notes that Lane “kept herself in concealment so closely that even her husband did not know that she was the writer who was making this stir in our limited literary world” (Lane 2000, 5).⁴ *Mizora* can be seen as an almost paradigmatic example of a literary utopia. It deploys the conventional ploy of a traveller journeying from our world to another, where she encounters a society which is organized along notably different lines than contemporary readers would be accustomed to. In this case, and here is a first significant deviation from the usual utopian template, the traveller is female: a Russian woman by the name of Vera Zarovitch, who, as Pfaelzer informs us (2000, xiv), is very likely modelled on Vera Zasulich, who, like the novel’s protagonist, was exiled from Russia for her role in anarchist insurgency.⁵ While escaping from Russia, Lane’s Vera Zarovitch gets lost on the Arctic Ocean and finds herself sucked into a gigantic current. After the decidedly orgasmic experience of penetrating “a curtain of rainbows fringed with flame,” dying the little death of a “semi-stupor, born of exhaustion and terror,” and reawakening to a “rosy light, like the first blush of a new day,” she finds herself near the “shores of a new and beautiful country” called Mizora (Lane 2000, 13–14). After first taking in the sights and sounds of this “land of enchantment” (14), she eventually meets a young woman called Wauna, who quickly becomes her confidante and person of reference, as well as Wauna’s mother, the Preceptress, who, as the head of the National College, is aptly positioned

white women were not having enough babies and that soon nonwhite, lower-class populations would become the majority,” adding that concerns regarding race suicide “were typically voiced in Darwinian, survival-of-the-fittest language” (2014, 97).

- 4 For anyone familiar with Gilman’s short story “The Yellow Wallpaper” (1892), this image of a women putting pen to paper in concealment from her husband will generate another interesting link between these two writers.
- 5 For a detailed account of the life of this eminent Russian, see Bergman (1983). For an investigation of Russian influences on Lane, in particular Nikolai Chernyshevsky’s *What Is to Be Done?*, see Wiemer (1995).

to impart on Vera her knowledge about the history, customs, and general do's-and-don'ts of her newly adopted home country.

Before we investigate this new home and the racist politics of purity on which its society is founded, we should first take a look at the way Lane establishes her narrator as a scientist and, more specifically, a female scientist. When Vera stresses both the "strong sense of duty" she owes to science and her description of her tale as "a simple narration of facts" (Lane 2000, 7), she quite clearly demands for herself the role of a serious analyst of the biological and sociological phenomena she encounters in Mizora, staking her claim for authority from the onset on its practical value rather than any abstract theorems and doctrines:

Yet, who, sweeping the limitless fields of space with a telescope, glancing at myriads of worlds that a lifetime could not count, or gazing through a microscope at a tiny world in a drop of water, has dreamed that patient Science and practice could evolve for the living human race, the ideal life of exalted knowledge: the life that I found in Mizora; that Science had made real and practicable. (Lane 2000, 7-8)

While she fails to acknowledge that this scientific ideal is essentially based on an eradication of difference and an equation of progress and whiteness, Vera nevertheless does her best to model her adventurous voyage to Mizora as a veritable anthropological field trip, from which usable and applicable intelligence is to be expected. In this light, her supplementary quip, that the "tongue of woman has long been celebrated as an unruly member," only to become—by dint of this, her very own narrative—"the primal cause of the grandest discovery of the age" (8), can be seen as a rather radical bid for female participation. By claiming the authority to generate and record her very own narrative of exploration and (grandest) discovery, she tries to subvert the previously very male annals of this particular genre. With a nod to Freud and Lacan, her "unruly" tongue could thus be stylized as a female substitute for the phallocentric patriarchal order, her scientific account of Mizora representing, in this reading, a refusal to accept and play by the conventional rules for conveying tales of colonial conquest and scientific world-making. In line with this self-perception as a scrupulous scientist, Vera approaches Mizora with a mixture of inquisitiveness, disbelief, and what we would nowadays probably call ambiguity tolerance. The first and most obvious cognitive dissonance she has to face is the total absence of men in Mizora, a segment of the population which, back home, had been of "vital necessity" and the general "arbitrator of all domestic life" (20), without whom neither the running of the state nor the running

of a respectable household would be feasible. Not so in Mizora, apparently, where men have followed the dinosaurs into well-deserved extinction “three thousand years ago” (93) and have been substituted by the “race of superior people” (110) that is the all-female, racially homogenously white society “of the highest type of blonde beauty” (15) in contemporary Mizora. The Kennedy-esque explanation for this development provided by the Preceptress—that “it is not what Nature has done for us, it is what we have done for her” (110)—not only underlines that, as far as the Mizorans are concerned, it is very much the obligation of (wo)mankind to show nature the correct direction in which to evolve; it also echoes notions of an inherent and, as it were, natural superiority of the female sex similar to those formulated by Gamble and Swiney, for whose vision of an eventual female triumph in the struggle for existence the Mizoran “family of sisters who knew no distinction of birth or position among themselves” (28) can figure as something like an apotheosis. And while Lane does not explicitly refer to parthenogenesis as such, the biological continuation of this triumphantly female society, based as it is on controlling the development of “the germ of all Life” (which is—tipping her hat to Darwin—also their “one common beginning” [103] or ancestor), is undoubtedly based, as Katherine Broad has it, on “parthenogenesis as a systematic and transparent narrative of scientific development” (2009, 250). In other words, the elimination of the male, and thus of gender difference, in the process of human procreation is presented as a necessary and scientifically required step towards the purification of human society.

When Vera subsequently learns more about how Mizoran society developed and by which means it is maintained, it becomes clear that the egalitarian sisterhood of Mizora, like that of Herland, is very much the result of a systematic act of social and biological engineering. “By following strictly the laws that govern the evolution of life,” so the Preceptress proudly explains, “we control the formation of the body and brain” (110). Her daughter Wauna exhibits a similar sense of superiority over Vera when she tells her that

had my ancestors thought as you do, and rested on an inferior education, I should not represent the advanced stage of development that I do. [...] The gradations of advancement from one intellectual basis to another, in a social body, requires centuries to mark a distinct change in the earlier ages of civilization, but we have now arrived at a stage when advancement is clearly perceptible between one generation and the next. (67)

Reaching this advanced stage requires the conquest and deactivation of the presumably unshakeable laws of the natural world, a feat from which the Preceptress extrapolates the developmental as well as the moral superiority of her own society over Vera's society of origin: "*You* are the product of a people far back in the darkness of civilization. *We* are a people who have passed beyond the boundary of what was once called Natural Law. But, more correctly, we have become mistresses of Nature's peculiar processes. We influence or control them at will" (90; emphases in the original).

But again, as in *Herland*, the prevailing of the female of the species in the struggle for—even physical—existence and the overcoming of "Natural Law" cannot be considered an unmitigated triumph of the subaltern, since it is predicated on notions and politics of racial purification similar to those we have encountered in Gilman's matriarchal fantasy. Mahady clearly pinpoints an "intolerance of difference" as the "precondition" for Mizoran social ideals (2004, 104), and Lydia Fisher recognizes the "distinctly racist maternalism" she identifies in Mizora as directly related to the social ideal of a cooperative society as proposed by Kropotkin (2014, 193). In Vera's report, the gendered and ethnic homogeneity of Mizora presents the indispensable foundation for those ideals to become achievable, as only this process of purification solves "the undeniable problem of racial difference and the difficulties it presents for a society based not on competition, but on mutual aid, by first acknowledging racial difference in the narrative, and then eliminating it" (200). Such a claim is not without real-life analogues either. Benjamin Kidd's *Social Evolution*, for example, highlights the interconnection of ideals of racial superiority and the moral improvement attached to a feminization of the human character and society, in which the release of an "immense and all-pervading fund of altruistic feeling" is cited side by side with the necessity to "abandon the idea [...] that the coloured races left to themselves possess the qualities necessary to the development of the rich resources of the lands they have inherited" as prerequisites for "the whole onward movement with which our age is identified" (1894, 298, 316).

Again, it is the notion of purity that is of essential importance for the workings and ideology of this all-female, all-white society. The realization of the Mizoran project of societal perfection and purification entails for one the suppression of bodily sexuality, which presents a potential breeding ground, quite literally, for the kind of interracial contamination which, under the name of 'miscegenation,' figures as one of the great moral panics of the late nineteenth century. In contrast, "our children," so Wauna reports, "come to us as welcome guests through portals of the holiest and purest affection" (130). By reconfiguring the female genitals in the process

of giving birth as immaculate gateways channelling religious virtue and unblemished chastity (it is not for nothing that parthenogenesis is colloquially known as 'virgin birth'), Mizorans eliminate the dangers of (moral) defilement and racially contaminated progeny that potentially accompany the act of sexual procreation. Noting the ambiguous, both liberating and restrictive, function parthenogenesis assumes in this elimination of sexual diversity, Broad observes how, in Mizora, "parthenogenesis releases women from prescribed gender roles as wives and mothers, but it continues to curb women's autonomy by citing women as bearers of a glorified social purity" (2009, 251).

In a similar attempt to eradicate diversity and impurity, Mizoran social engineering also entails the imposition of "a higher culture" (72) on the working classes, and, crucial in the light of my argument here, the "elimination" of those Mizorans with "dark complexions," since "the highest excellence of moral and mental character is alone attainable by a fair race. The elements of evil belong to the dark race" (92). In short, the Mizoran social ideal is only attainable by a quite literally select section of the population: non-working-class, white females.

In the course of her stay, Vera is comprehensively introduced and exposed to the history, ideology, scientific practice, and general self-understanding of her host country, and, mindful of her self-stylization as scientific observer, she attempts a summary assessment of the relative merits of the onward social development and the eugenic measures introduced to attain and maintain it. Accordingly, her judgement is balanced and considered: "I am," she says, "of the opinion that their admirable system of government, social and political, and their encouragement and provision for universal culture of so high an order, had more to do with the formation of superlative character than the elimination of the dark complexions" (92–93). In other words, the opinion at which Vera seems to arrive is that the ideal of racial purity and the apotheosis of whiteness is a mere afterthought to or by-effect of the biological realization of the morally and physically superior female ideal. Likewise, after 15 years in Mizora, Vera feels a strong yearning to return home, which suggests in itself a certain kind of reflexive distance from her object of (scientific) enquiry, a critical stance which sets her narrative apart from the glorification of white female supremacy we encounter in *Herland*. At the same time, it illustrates her awareness that Mizora is not an Elysian field of social equity—an assessment reinforced by the Preceptress's unequivocal establishment, earlier on, of the unsurmountable evolutionary gap between Vera's society and Mizora. Moreover, the fact that Wauna, who accompanies Vera back to 'our' world, dies shortly after arrival also goes to show that the utopian

world of Mizora—while providing an interesting thought experiment—is nowhere near fit for the practical purpose of late Victorian socio-political reality, as the “lofty ideal of humanity that she represented was smiled at or gently ignored” (145).

What conclusions can we, as readers, now draw from Vera’s assessment? I agree with Broad that the elimination of sexuality and the subsequent avowal of moral purity helps to subvert the Victorian patriarchal order by reducing conventional gender roles and ascriptions to absurdity while, at the same time, retaining another conventional patriarchal strategy for upholding a hierarchy of the sexes, which is the inherent connection of women to the natural world. I disagree, though, with her view that the novel fully endorses the elimination of difference, relating to both gender and skin colour, on which Mizoran superiority seems to be based. I would rather read the novel not primarily as a biological utopia of pure and purely white femininity—although it also invites such a reading. Instead, I would suggest taking Vera, our narrator, at her own word and understanding her journey to Mizora as a scientific and, in particular, sociological thought experiment, which she observes as disinterestedly as possible and of which she finally comes to appreciate some aspects, such as “the beauty and charm of the public parks” (41) or the replacement of nobility of birth by intellect and educational merit as social means of stratification (cf. 42–43), while disapproving of others, like the extinction of all forms of animal life (cf. 54), the complete lack of any form of spirituality (cf. 131–32), or, indeed, the elimination of ‘man’kind 3,000 years earlier, for whom she weeps “the bitter tears of actual experience” and with whom she identifies precisely on account of their shared history of emotional, and thus necessarily capricious, inconsistent and impure, human condition: “*They* had experienced the treachery and ingratitude of humanity, and had dealt in it themselves. *They* had known joy as I had known it, and their sorrow had been as my sorrows. *They* had loved as I had loved, and sinned as I had sinned, and suffered as I had suffered” (91; emphases in the original). Notwithstanding her fascination with the rigidity of Mizora’s socio-moral purification and, above all, their scientific achievements (the Mizorans, we are informed, for example, have become proficient at the process of separating “water into its two gases, and then, with their ingenious chemical skill, converted it into an economical fuel,” 58), Vera understands implicitly that this “immense family of sisters who knew no distinction of birth or position among themselves” (28) at the same time represents a loss, or at least a fundamental re-definition, of what it means to be human, and she is not prepared to accept this unreservedly. Somewhat counterintuitively, the undoubtedly racist politics of

purity in the novel need, therefore, to be understood—borrowing a term from Rangan and Chow—as “a technology of rationalization” (2013, 404) for Vera, as an imaginative figuration by a female scientific narrator with the aim of trying to evaluate and weigh up the multifarious implications of such quests for purity.

Conclusion

So, if we finally put *Mizora* on the scales, we can note with Fisher that the novel “proves to be unusually sensitive to the problems and pitfalls of a progressive scientific vision” (2014, 182) and concur with Pfaelzer that it is “a vexing and vexed novel” (2000, xi). It is not, however, a white supremacist phantasy of racial purity run by a brigade of flaxen-haired Brunhilds, an accusation which could be levelled with considerably more justification against Gilman’s *Herland*, which attempts to prove, as Hudak perceptively observes, “that the ‘best’ kinds of people resemble Gilman herself: upper-middle class white women whose rejection of gender stereotypes relies upon notions of racial purity” (2010, 475–76). I would rather follow Pfaelzer in seeing *Mizora* as “an unstable text that resists as it reproduces its era’s concerns with sexuality, race, domestic labour, aesthetics, and female education” (2000, xi). As I have tried to demonstrate in this article, it is particularly sensitive when it comes to the interplay of notions of racial and moral purity, where it allows for two interesting suppositions: first, with regards to gender, it calls attention to the potentially ambiguous consequences of deploying evolution to argue for an innate female superiority, let alone monocracy, however emancipatory and liberating this may seem at first glance. Rather, as Vera’s confident self-stylization as a scientist demonstrates, evolution should be read as providing equal opportunities for both sexes when it comes to exploring, describing, and making sense of the world. In this context, *Mizora* certainly complicates one traditional assumption about gender in the imperial imagination, namely, that the woman’s place is in the home and at the hearth, while it is incumbent upon the male to scientifically explore, ‘civilize,’ and, if necessary, subjugate ever more new imperial spaces. Second, when seen from an explicitly post-colonial perspective, the uniformly white sisterhood of *Mizora* represents confirmation that social and cultural progress and liberation is never pure and always necessarily a relative concept; that, more often than not, what we today would, on the whole, consider to be positive developments, like female empowerment and participation, can go hand in hand with, or can even be reliant on, more adverse transformations,

like in this particular case the elimination of ethical difference or eugenic social engineering. *Mizora's* imaginative achievement is precisely this: it invests a woman with enough scientific authority to reveal and deliberate the endless complexity and multiple contingencies that adhere to any notion of human purification and, in so doing, muddles those apparently clear-cut ideological boundaries and hierarchical power relations that underpin both the patriarchal and the colonial regime.

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Beyond the Cultural Stereotyping of Science: Michael Ondaatje's *Anil's Ghost* and the Postcolonial Science Novel

ABSTRACT This essay explores the contribution which postcolonial fiction may make to critiquing, shaping, and revising cultural narratives about science and related knowledge practices in diverse geopolitical settings. Singling out cultural narratives of a 'spread' of 'Western science' which have traditionally been a prominent component of twentieth-century modernization narratives, the contribution shows how postcolonial fiction can take the narrative representation of science and related knowledge practices beyond the cultural stereotyping whose formative influence has by no means been completely superseded in popular perceptions and even critical accounts of the cultural place of science. Set against the background of a spectrum of Anglo-American and South Asian 'science novels,' and drawing on conceptions developed by Ong and others ('science as global assemblage,' 'Euro-American cosmopolitan science'), the essay offers a detailed reading of science and related knowledge practices in Michael Ondaatje's *Anil's Ghost*. The essay specifically highlights three related textual strategies that inform the dynamics of plot, character constellations, and narration: a first and fundamental strategy, the gradual pluralization of instantiations of science and related knowledge practices, is complemented secondly by the critical distancing against any bids to promote a cultural stereotyping of science. Both provide the basis for a third strategy, which makes *Anil's Ghost* stand out among postcolonial science novels: the detail and intensity with which the novel works to establish and profile an alternative, culturally and geopolitically sensitive perspective on science.

KEYWORDS Euro-American cosmopolitan science, internationalism in science, postcolonial science, Science in fiction, science narrative

“The National Atlas of Sri Lanka has seventy-three versions of the island,” begins one of the enigmatic italicized passages that interrupt the narrative of Michael Ondaatje’s *Anil’s Ghost* at certain points. *“The geological map reveals peat in the Muthurajawela swamp south of Negombo, coral along the coast from Ambalangoda to Dondra Head, pearl banks offshore in the Gulf of Mannar. Under the skin of the earth are even older settlements of mica, zircon, thorianite, pegmatite [...]. Plumbago graphite—veins and flakes of it—graphite of the greatest purity (ninety-seven percent carbon), which would be mined in Sri Lanka for one hundred and sixty years, especially during the World Wars, six thousand mines around the country [...]. Another page reveals just bird life. [...] There are pages of isobars and altitudes. [...] There are no city names. [...] There are no river names. No depiction of human life”* (Ondaatje 2000, 35–36).¹

The novel immediately follows this passage with a different list, one whose close connection to the narrative is much more readily visible and which also extends over two pages: the record of names and dates of disappearance and places last seen of people understood to have been taken by the secret forces of one or another of the three sides in Sri Lanka’s civil war:

Kumara Wijetunga, 17. 6th November 1989. At about 11:30 p.m. from his house.

Prabath Kumara, 16. 17th November 1989. At 3:20 a.m. from the home of a friend.

[...]. (Ondaatje 2000, 37)

As the plot unfolds, the knowledge of the island’s layers of soils, vegetation, and mining sites will contribute vital evidence towards the successful completion of the novel’s forensic science plot: the search for the identity and origin of an unidentified victim of political violence. Through many small steps, a multi-disciplinary forensic examination of a skeleton reveals the victim to have been a miner who had worked in a plumbago-graphite mine (201). The human dimension is ostensibly disavowed by the scientific representations of Sri Lanka in the first passage, in spite of the manifest presence of a history of colonial extractivism in the account of the geological makeup of the island. It is made visible throughout the novel not only through the spotlights on the lives of victims but, above all, through the collaboration of an unlikely group of investigating scientists, who use their aggregate range of scientific and local expertise in order to establish the links between the earth and the inhabitants: “A good archaeologist can read a bucket of soil as if it were a complex historical

1 The author gratefully acknowledges the support of the Volkswagen Foundation in funding the research for this contribution.

novel,” the protagonist muses at one point, as she admires the skills of her fellow scientific investigator. “If a bone had been grazed by any kind of stone, Sarath, she knew, could follow such grains of evidence to their likely origin” (147).

Anil Tissera and Sarath Diyasena form the central duo of scientist protagonists, but they are by no means the only scientists in the novel. Their evolving partnership in the unfolding inquiry not only brings them up against the interplay of the warring factions in Sri Lanka’s civil war of the 1980s and 1990s (in which, across different regions of the country, the government is engaged with Sinhala guerrillas on the one hand and Tamil guerrillas on the other); their investigation will also involve a journey across a spectrum of additional knowledge practices, mostly made accessible through Sarath, some of which defy the received binary categories of ‘science’ on the one hand and ‘indigenous knowledge’ on the other. The novel presents to its readers a range of knowledges that makes visible the intersections and interrelations between the more conventional, ‘Western-style’ conceptions of ‘science’ and the forms of expertise and cultural practice which come with the knowledge of the places, the locales in which the practices of science take place.

What becomes visible are gradations in which science is articulated and inflected within a specifically constituted field of knowledge practices—science in a global, political, and cultural spectrum, taking a particular shape and producing particular versions of scientist subjecthood in conjunction with these specific cultural and geopolitical settings. What emerges, accruing as the novel’s plot unfolds, is a particular assemblage of knowledges representing ‘science’ in its particular cultural settings, creating an insight into the ways in which ‘science’ is specifically situated (not despite but along with its constitutive claim to universalism) and is invariably inflected by its adjacent knowledges, by its social contexts, and by the ways in which these are run through with different forms of power, different forms of violence.

In the substantial amount of criticism and scholarship dedicated to the novel since its publication more than two decades ago, the significance of science in *Anil’s Ghost* has by no means gone unrecognized, and neither has the novel’s engagement with Sri Lankan cultural traditions (cf. e.g. Marx 2012; Mackenthun 2014). Critics have identified and discussed many of the individual elements of the novel connected to ‘science’ as well as the ways in which characters are tied to particular understandings of ‘science’ (cf. Higgins and Leps 2009). They have examined Anil’s scientific outlook (cf. Barry 2015) and the development of her perspective in the course of the novel (cf. Babcock 2014; Ganguly 2014). In this context, the roles of Anil,

Sarath, and of other characters tied to forms of scientific and cultural knowledge have also been addressed with a more or less specific or selective focus (cf. Valkeakari 2013; Ganguly 2014; Shetty 2016). At the same time, the novel's representation of cultural knowledges and practices has also called forth critical attention and fuelled critical debate, which has at times been quite intense and divergent in seeking to identify the critical perspectives suggested by the novel's narrative structure, especially in relation to the representation of Buddhism and Sinhala identities (cf. e.g. Kanaganayakam 2006; Goldman 2004; Knowles 2010; Ratti 2013).

Critical attention has not yet focused on how pervasively science is present in the novel. Choosing this focus will reveal the many ways in which 'science' is tied up with the plot structure, with the spectrum of knowledges and knowledge practices, and with the concomitant spectrum of characters in which Anil and Sarath, though central, are just two particular representatives of specific cultural inflections of 'science.' Along with other postcolonial science novels published since the turn of the twenty-first century, *Anil's Ghost* can be seen as a contribution to changing the narratives that have hitherto operated on the basis of *the cultural stereotyping of science*. Ondaatje invokes one of the long-dominant received patterns of the narrative of Western science but refuses to sustain its claim, pluralizing and contesting it instead and thereby enabling the perception of a wider range of knowledge practices, of what could be called geocultural inflections of science. Rather than a comprehensive picture, the novel presents a set of spotlights. These appear exemplary in the sense that they represent positions in a spectrum, but they also foster an understanding that the spectrum of knowledge practices itself contains many other possible inflections, among which the long-received Western conception of science is only one of many. In this sense, *Anil's Ghost* could be seen as an introduction to these cultural and geopolitical inflections of 'science': an introduction to the local assemblages which make up particular instantiations of 'science' along with, rather than despite, its more prominent universalist dimensions.

Beyond the Cultural Stereotyping of 'Science': Science as 'Global Assemblage'

As the introduction to this volume outlines in greater detail, the predominant view of 'science' was unquestionably Eurocentric until well into the late twentieth century. Science was understood as a specifically, and perhaps exclusively, 'Western' phenomenon; it was considered to have emerged in early modern Europe; its history and progress were understood

to be linked to the processes of modernization and secularization. These, in turn, were invoked as the basis of European claims to geopolitical dominance which lasted into the second half of the twentieth century. The modernization theory of the 1950s and the idea of a “spread” of Western science across the globe (Basalla 1967) continued to play their role in the second half of the twentieth century, when the competition for geopolitical dominance became a matter of the opposing ‘blocs’ of the ‘East’ and the ‘West.’ The idea of a transcultural and universal validity of the concepts, procedures, and results of science was thus connected to claims of cultural hegemony linked to particular geopolitical parameters.

These unilateral and Eurocentric conceptions of ‘science’ appear to have endured into the ‘science wars’ of the 1990s but have more recently been supplanted, not least through the work of scholars aligning themselves with postcolonial perspectives, both in the history of science and in science and technology studies. Rather than upholding the binaries of ‘indigenous knowledges’ vs ‘Western science,’ the focus has increasingly been on the historical co-production of scientific knowledge in colonial or transcultural encounters, the ongoing local and global entanglements in the production of scientific knowledge, and the critique of persisting disparities. As indicated in greater detail in the introduction to this volume (cf. above), recent work in science and technology studies has provided the tools that can help us move beyond the reductionism of traditional cultural stereotypes on science.

At a very general level, it appears that two major alternatives have established themselves, if not instead of then, at least, alongside the concept of ‘Western science.’ They would distance themselves from embracing an ‘anti-science attitude’ on the grounds that to decry the colonial and imperial complicities of science and to reject science in favour of the alternative of indigenous knowledges were, in fact, to reinscribe the identification of ‘science’ with ‘Western.’ Instead, what they share is the conviction not that “Science [must] fall” but that “the myth that science belongs to white people must [fall],” as one blog writer succinctly phrased it (Shortridge 2016). Firstly, in the context especially of more recent interventions in redrawing geopolitical constellations, the mounting of counterclaims has emerged as one way to contest conventional forms of the cultural stereotyping of science. To present a claim of precedence for ‘Eastern’ science, as for instance the Hindu nationalist positions analysed by Banu Subramaniam in *Holy Science* (2019) do, still maintains the continuity of the dynamics driving the quest for cultural prestige and geopolitical capital that is apparently to be derived from the idea of precedence, superiority, or exclusiveness in the practice of ‘science.’ Pursuing what may be described as a strategy of

geopolitical reversal, then, does not fundamentally alter the perception of 'science,' which still figures here as an activity and a body of knowledge with universal validity but which is, at the same time, entangled with cultural privilege. Both from a historical and a strategic perspective, however, a second and more radical alternative emerges. In this perspective, the recognition of the colonial and imperial complicities in the history of science may best be matched with the recognition of the numerous forms and instances of co-production of scientific knowledge which the cultural stereotype of 'Western science' has continued to disavow and erase, as well as with the recognition of the many forms in which past imbalances and disparities in the practice, the institutions, and the distribution of credit in science continue to be maintained and reproduced in contemporary settings, or have been supplanted by other, newer imbalances and disparities.

An effective conceptual alternative to the cultural stereotyping of science will, therefore, best be grounded in a conception of 'science' that differentiates between the 'universal' and the 'culturally inflected' in the conglomerate of concepts, practices, and institutions which are generally designated as 'science.' I have so far tended to place 'science' in quotes in order to indicate what is, of course, a well-established insight in science studies: that the term cannot just be taken for granted. 'Science' frequently serves as a shorthand for a whole set of concepts, practices, and institutional settings that make up the range of disciplines that tend to fall under the designation of 'the sciences.' Both the multiplicity and sometimes heterogeneity of practices, concepts, and settings and their shared points of reference and allegiance are best captured in the suggestion put forward by Stephen Collier and Aihwa Ong to conceptualize science as *global assemblage*, to which the editors of this volume also make reference in their introduction (cf. above). Defined as "ensembles of heterogeneous elements" (Collier and Ong 2005, 5), the concept of 'assemblage' counters and places the concept of "a universal science that floats beyond local mediations" (Ong 2016, xiii), while the term 'global assemblage' "suggests inherent tensions: global implies broadly encompassing, seamless, and mobile; assemblage implies heterogeneous, contingent, unstable, partial, and situated" (Collier and Ong 2005, 12).

In a subsequent study, Ong introduces the term "Euro-American cosmopolitan science" in order to foreground these tensions in the place of "simplistic [...] North-South contrasts" (Ong 2016, xiii), and it will be useful to adopt this phrase precisely for the tensions which it evokes between the 'cosmopolitan' and the 'Euro-American.' Following Bruno Latour, we may describe a constitutive asymmetry in scientific practice, raising the question of the location of what Latour termed the scientific 'centres of

calculation' (Latour 1987, 220). The term 'cosmopolitan' implies that these 'centres of calculation' may in principle be situated anywhere, while 'Euro-American' acknowledges that they frequently are, in fact, situated in the metropolitan settings of learning and research which are historically linked to the colonial powers. The phrase 'Euro-American cosmopolitan science' then draws attention to the ongoing specific disparities and imbalances in the distribution of institutional resources for scientific practice which go hand in hand with the existence of science as 'global assemblage,' as 'emergent,' as 'encompassing' and 'mobile,' but also 'heterogeneous,' 'contingent,' 'unstable,' 'partial,' and 'situated.' To speak of 'Euro-American cosmopolitan science' is to recognize this tension: "In order to be universalizable, cosmopolitan science depends on [a] constant effort to be particular, to remediate situated elements," "so that it can attend to an array of 'global' scientific problems" (Ong 2016, xiii).

This perspective will provide a conceptual space that accommodates also what Ong describes as the rearticulation of science in other "research milieus" (Ong 2016, xi)—the range of assemblages that exist in different places in which this "constant effort to remediate situated elements" plays out in different places, and in ways that are both similar and different. If we think of science as real assemblage in a permanently emerging, evolving state, we may also have a conceptual tool for taking into account its specific "milieus"—its particular varieties of cultural situatedness, giving rise to what I have referred to above as 'cultural inflections of science'—while avoiding the inadequate reductionism of the binaries of universality vs. cultural relativity.

'Euro-American Cosmopolitan Science' in Contemporary Fiction

The internal plurality and heterogeneity, the 'emergent' quality of 'science' and even its character of assemblage—these ideas are not necessarily news among scientists, who tend to be aware of the processual character of their activities, of the complex spectrums of fields and locations in which they work, as well as of their multiple divisions into specialisms. However, this perspective has tended to be decidedly under-accentuated in widespread public usage of 'science.' Discussions and invocations of 'science' in the publicly mediated discourses have had a tendency to reinscribe clichéd images and reproduce clichéd narratives; and the reductive binaries circulated in the context of the so-called 'science wars' (cf. *Lingua Franca* 2000) have not been conducive to a better understanding. By contrast, literary

narratives since the late twentieth century have increasingly begun to produce more nuanced representations of ‘science’: differentiated, partial, situated accounts of scientific practice and scientific practitioners, often around hypothetical scenarios, but always clearly conscious of the quality for which Collier and Ong have proposed the term of ‘assemblage.’ Science novels, and specifically postcolonial science novels, have thus for a good while taken the road of representing science in these more complex and differentiated perspectives. Reading a novel such as *Anil’s Ghost* as a postcolonial science novel reveals the ways in which the specific means of literary narrative are used in order to open up perspectives, which will be helpful in discussing the complex and contradictory roles of ‘science’ in contemporary global constellations.

The term ‘science novel’ has begun to gain traction to describe a growing tendency in recent literary fiction to make ‘science’ a core concern, as well as a core component of the fabric of a novel (cf. Gaines et al. 2013; cf. also Gaines et al. 2021; Roxburgh and Clayton 2021). In distinction to the older genre term of ‘science fiction,’ ‘science novels’ give prominence to science as an element in fiction which otherwise employs the mix of realist and postmodern aesthetic and narrative devices characteristic of ‘literary fiction’ as well as the predominantly character-driven plot constructions which characterize that section of the market for fiction on which the attention of literary scholars, literary reviewers, and literary prizes tends to focus. The term ‘science novel’ has emerged along other, earlier coinages, such as ‘science-in-fiction’ (Djierassi, quoted after Gaines et al. 2013, 7) and ‘lab lit’ (Rohn 2010). It appears more suitable than these for designating fiction in which some or all structural elements—plot construction, narrative perspectives, and strategies as well as characters and character constellations—may severally or comprehensively integrate aspects, issues, practices, and concepts associated with ‘science.’

The representation of science in Euro-American science novels has tended to be quite sensitive to the character of ‘science’ as an assemblage. Rather than as a unified and monolithic site of authoritative knowledge production, the novels make visible the societal, economic, and political pressures and expectations which are brought to bear on ‘science’ as well as the struggles for funding and recognition, the power relations and power differentials within scientific institutions, and the conflicts and competition among scientists and scientific institutions.

In terms of their representation of the international dimensions of science and of their mere geographical and geopolitical scope, these novels tend to adopt and reproduce the perspectives linked to ‘Euro-American cosmopolitan science,’ even if in some cases they seem to invite a critical

reflection. The problems that science is called on to address may in many cases be global in scope and relevance, but the locations for the scientific work done to address these problems are linked to North American or European scientific institutions, and the scientist protagonists are European or North American.

Allegra Goodman's *Intuition* (2006) is one case in point. The novel is set in a cancer research lab in the US and recounts a phase in the history of this lab, including the two directors and their families as well as the lab technicians. It focuses on the professional and personal relationships among postdocs who are working in parallel, as teams built simultaneously on cooperation and competition. The team of postdocs is international in its composition. Cliff, one of the protagonists, shares a flat with Prithwish, a fellow postdoc from Sri Lanka, and shares the work on his specific project with a young scientist of Chinese origin, Feng, who turns out to be a good deal more conscientious than he. The exoticizing, orientaling angle in the media coverage of their project, focusing on Feng and his Chinese origins, is put on critical display within the novel but does not prompt the inclusion of an alternative representation. Both Prithwish and Feng remain supporting characters whose conflicts are mentioned but not focused on. The novel's core issues continue to revolve around US characters as well as the conditions of scientific practice and its societal contexts in the US (cf. also Kirchhofer and Roxburgh 2016).

A similar focus operates in Margaret Atwood's *Oryx and Crake* (2003). The novel's dystopian near-future setting is centred entirely in North America, both before the wave of human extinction which will leave only a small number of survivors fending for their existence, and after. There is mediated evidence of global exploitation, and the character of 'Oryx' provides an emblem of this. Her life story, framed within the structures of human trafficking and the exoticizing demands of the porn industry, leads her into contact with the novel's scientist protagonist, Glenn ('Crake'), as well as his literary sidekick, Jimmy ('Snowman'), through whose not-always-reliable perception the entire story is presented. Scientific practice is ethically compromised and entirely pressed into the service of unfettered capitalist exploitation by the corporations now running all social and scientific institutions. Crake has been recruited, on account of his unequalled excellence in genetic engineering, to a position of immense research freedom and means in exchange for a steady output of new and marketable scientific results. Places outside North America, within the framework of the novel, play no roles as locales of knowledge or scientific practice; though they are present through side-glances, as sites of exploitation and extraction, where people participate in or cope with or rebel against these structures.

They are included, too, in Crake's grand scheme of human extinction, conceived out of his disgust at the morally bankrupt world of near-future North America and designed to inaugurate in its stead a more just, peaceful, and sustainable posthuman future, again located in North America.

Ian McEwan's *Solar* (2010) perhaps goes furthest towards an explicit illustration of the imbalances in the geopolitical distribution of the settings for science as well as the asymmetries that govern established perspectives on science and established patterns of participation in science. The novel revolves around projects for addressing the issues of climate change, the global demand for energy, and the need for clean and renewable energy supplies, thus dealing with problems which are global in character. The scientist protagonists repeatedly discuss the societal obligation of science to 'save the planet' (cf. e.g. McEwan 2010, 25, 34). But in terms of the representation of the settings for science, the internationalism of science is limited to classically privileged settings in Europe and North America. The fictional projects and discoveries are all the work of British and American scientists; all locations are either British or American sites and research institutions. All other relevant venues mentioned are located elsewhere in Europe: the Nobel Prize Committee at Stockholm, the prestigious Solvay Conference in Belgium, or the "80 Degree North Seminar," which takes place in Norway. The problems are global in this narrative, but the key scientific players remain Anglophone, European, and American.

Solar displays a clear sense of this asymmetry, but it does not offer any substantially diverging perspectives in its makeup of character constellations and plotlines. The disparities inherent in the propagated image of science as an international and progress-oriented project are targeted mainly in the novel's satirical dimensions. In presenting its problematic protagonist Michael Beard, the novel not only highlights the connections of the Nobel-Prize-winning physicist to an international scientific network but also foregrounds the ways in which the version of Euro-American cosmopolitan science which he represents is riven through with "special pleading," "gossip," and "the politics of science" (McEwan 2010, 14). The protagonist is conscious, too, of "a terrifying nationalism" (14) in science, as the dominant nations in the world rival each other for global leadership in research, competing for the prestige and scrambling over the symbolic capital associated with excellence in science. One reason why Beard was awarded the Nobel Prize in the first place may have been that "it was felt to be the turn of British physics anyway" (51).

Postcolonial science novels, by contrast, tend to take on the imbalanced internationalism of science not only by putting it starkly on display but also by providing alternative perspectives that work to disengage science

from its definitional associations with Western cultural hegemony. Amitav Ghosh's *The Calcutta Chromosome* (1995) is masterful in its imaginative and subversive rewriting of one of the heroic episodes in the 'official' history of science: Ronald Ross's discovery of the modes of transmission of malaria in 1898. Instead of forming a mere backdrop for breakthrough science achieved by the British colonial scientist, the colonial India in which the novel is set comes to be revealed as the site of a cult of counter-science whose insights and goals are far in advance of those achieved by colonial medicine, and whose exponents, masking themselves as subalterns, envelop and secretly manipulate all the scientific work recorded in the 'official' history of science, including that claimed by Ross for himself. At the same time, however, the novel to some extent still parallels the confrontational constellation characteristic of the 'science wars' of the 1990s. Ghosh's slightly later novel *The Hungry Tide* (2004) moves beyond the duality of the binary opposition between Western science on the one hand and local or indigenous alternatives on the other. Instead, it juxtaposes, complements, and partly amalgamates the perspectives, goals, and procedures of institutional science (represented by the 'returned migrant scientist' heroine Piya) with the local and indigenous perspectives of the political activists and the indispensable practical knowledge of the local partner Fokir, whose share in their research on river dolphins she recognizes and commemorates rather than seeking to appropriate, reformulate, and erase it (see also Chapter 7 in this volume).

Jaspreet Singh's *Helium* (2013) revolves around a traumatized scientist protagonist and narrator, revisiting the settings where he became a helpless witness to the anti-Sikh pogroms following the assassination of Indira Gandhi, and particularly the mob torturing and killing of his academic mentor. As the narrator tries to face up to his long repressed memories and follows the trail to where the victim's widow has preserved documents which contradict the official denial of any state involvement in orchestrating the murderous mobs, the novel also provides a complex and multi-layered range of instantiations of science, e.g. by invoking the colonial dimension of scientific discovery as it represents the research history of helium, or by reading the Bhopal disaster as an effect of striking disparities in the societal relevance of science, of a striking disjuncture between science and society in India (cf. Kirchhofer 2022; Kirchhofer and Roxburgh 2016).

Manu Joseph's *Serious Men* (2010) is set in a fictitious research institute riven by conflicts between factions with diverging political affiliations, and also addresses the operation of factors such as gender and caste within the institution (see Chapter 8 in this volume). Through the satirical mode that runs through the text as much as it does through McEwan's *Solar*,

Serious Men is also perhaps the novel which mounts the most placative and blatant challenges to Western cultural bias in the received accounts of science, in the shape of the scientific outlook of the character of Aravind Acharya—physicist, cosmologist, and director of the Institute. But his approach represents a headlong attack on what he perceives as the cultural bias in the received theory of cosmology, and it is one of the threads that run through the novel: Acharya, we find out, was “convinced that the wide acceptance of the Big Bang theory was influenced by a Christian compulsion to believe in a beginning and an end [...] It was a Belgian Catholic priest named Georges Lemaître who in 1927 had come up with the idea that the universe began from the explosion of an atom” (Joseph 2010, 301): “The Vatican wanted a beginning and the Big Bang provided one” (41). Acharya pursues an alternative hypothesis according to which the universe is permanent, and full of life at a microbiological level. This accounts, according to his hypothesis, for the existence of ‘Junk DNA’: “Life travels through the universe as microscopic spores riding on asteroids and they fall on different worlds. Depending on the conditions in those worlds, different segments of the genome become useful. On Earth, only a fraction is needed” (220). Acharya’s theories will be sadly discredited through the machinations of his institutional rivals, though these in turn will be unmasked as falsely discrediting him as a fraudster. The fraud is exposed and he is rehabilitated, but the novel does not show him finding proof for his hypothesis. What this character does, however, is present a powerful invocation of the possibility of scientific alternatives to the assemblages of “Euro-American cosmopolitan science.”

My brief contrastive survey of British, North American, and South Asian science novels may illustrate how the project of highlighting geopolitical disparities and presenting culturally inflected perspectives on science distinguishes postcolonial science novels from many of their Euro-American counterparts. Michael Ondaatje’s *Anil’s Ghost* (2000), as I aim to demonstrate in the remainder of this contribution, not only shares this project but puts into operation a particularly wide-ranging and differentiated set of textual strategies in order to pluralize conceptions of science within a wider spectrum of related and culturally inflected knowledge practices, to challenge any claims connecting science to ideas of cultural hegemony, and ultimately to establish an alternative, culturally and geopolitically sensitive perspective on science.

Pluralizing Science in *Anil's Ghost*

To read *Anil's Ghost* with a focus on its representations of 'science' is to bring into view a remarkable breadth and variety of engagement. Unlike many other 'science novels,' *Anil's Ghost* does not focus on any particular scientific issue, concept, or discipline: the novel unfolds a wide spectrum of practices and disciplines, of issues and angles of problematization, connected to different scientific disciplines. Forensic pathology, archaeology, and medicine figure prominently but by no means exclusively. Importantly, the spectrum also includes what we may understand as 'adjacent knowledges,' specific knowledges and cultural practices which would not conventionally range under the designation of science but which, in the novel, become recognizable as related knowledge practices and near functional equivalents. The connections between these various knowledge practices unfold gradually, through a process of detection which forms the central plotline: the goal of establishing the identity of one single victim of political violence whose skeleton was located at an archaeological site, mixed in among the human remains long buried there. At the same time, the novel also highlights and problematizes the different 'narratives' of the role and history of 'science' which are proposed for the perception and self-perception of scientists.

From the outset, the novel foregrounds the geopolitical dimensions of the scientific practices it represents, in ways that effectively resist the long dominant narratives on science in global perspective. This is illustrated emblematically in the opening sections of the novel. Readers first encounter Anil Tissera exhuming and identifying the remains of victims of political violence and civil war situations, in close exchange with the survivors and relatives of those victims. She is clearly introduced as an exponent of Euro-American cosmopolitan science. Born and raised in Sri Lanka to a wealthy family background, she spent a privileged childhood in Colombo but left after the death of her parents to do her medical training in Britain and the US (cf. Ondaatje 2000, 32). A brief marriage to a fellow Sri Lankan, quickly followed by divorce, serves to increase her distance rather than bind her to her place of origin. Having specialized in forensic pathology, Anil goes on to work under the auspices of an international "Center for Human Rights" based in Geneva (12). When we meet her first, in a kind of prologue set in Guatemala, she is engaged in the slow and patient work of justice and incomplete reparation. Her return to her native country is on a limited-term assignment, which allows her a period of seven weeks to shed light on the question of the Sri Lankan government's involvement in the ongoing political killings. By the time she returns to Sri Lanka, after 15 years of absence, she barely speaks Sinhalese any more (32), and right to

the end of her assignment, she asserts her adherence to the international humanitarian framework pitting her against the Sri Lankan government, stating: "I came here as part of a human rights group. [...] I work for an international authority. [...] We make independent reports" (271). Anil's commitment is thus to a particular facet of Euro-American cosmopolitan science, understood in the service of human rights, ethics, and truth—concepts whose implied claim to universalism is represented to be quite as much in need of a geopolitical inflection, as several readings of the novel have pointed out (cf. Ratti 2004; Derrickson 2004; Davis 2009; Babcock 2014).

In spite of this alignment, the novel emphatically does not endorse a construction of the situation as a contrast between political violence as local, and justice and science as international. Instead, it insists on the specifically international dimensions constitutive for the conflict in Sri Lanka. Sri Lanka is indeed the site of the conflict, and the people living there are sometimes agents and often victims of the conflict:

The terrorism of the separatist guerilla groups, who were fighting for a homeland in the north. The insurrection of the insurgents in the south, against the government. The counterterrorism of the special forces against both of them. The disposal of bodies by fire. The disposal of bodies in rivers or the sea. The hiding and then reburial of bodies. (Ondaatje 2000, 38–39)

At the same time, the novel is careful to caution its readers against constructing the situation in terms of a contrast between international humanitarian interest and local crime and violence. Far from being merely 'local' in character, the situation is enabled and sustained by "backers on the sidelines in safe countries"; it is "a war sponsored by gun- and drug-runners" in which "political enemies were secretly joined in financial arms deals" (Ondaatje 2000, 39). The conflicts that ravage Sri Lanka, and to which the presence of Anil and the concern of international human rights groups are a response, are thus clearly marked out as being contingent on international currents and relationships, and run through with the interests of international organized crime.

Nor does the novel allow Anil's scientific expertise to stand as evidence for a narrative of international science coming face to face with traditional indigenous knowledge. Instead, the insights which the novel offers into cultural knowledges, cultural traditions, and cultural practices in Sri Lanka are mediated via encounters with Sri Lankan scientists. Science is thus shown to be an international endeavour, a global assemblage with a spectrum of cultural inflections. While the dynamics of the investigative plot provides the bracket that connects the spectrum of positions, its effect

is to extend the concept of scientific practice beyond the Euro-American perspective adopted by Anil and to anchor it in many places in Sri Lanka, highlighting its connections both to the cultural traditions of the country as well as to its current conflicts.

What Anil encounters in Sri Lanka is different varieties of science and knowledges, crystallized in specific assemblages. It is a range of scientific expertise and of knowledge positions and traditions that Anil does not possess, but that nevertheless proves indispensable to the completion of her assignment. Along with some artisanal and religious traditions which also contribute indispensable components, she comes face to face with different varieties and instances of cosmopolitan science—different in location but by no means locally confined, they are, rather, differently positioned and differently international.

This image will emerge as a result of three interrelated textual strategies that I will seek to highlight in the remainder of this contribution.

Science in a Spectrum of Knowledge Practices

The *first* and fundamental strategy employed in the text is the *gradual pluralization of instantiations of science and related knowledge practices*. This has the effect of unfolding a broad spectrum of aspects of science in local as well as international connections, among which the conventional received conception of Euro-American cosmopolitan science is only one.

One of the stipulations of Anil's assignment is a local partnership, and it is this which triggers a process of pluralizing instantiations of science and related knowledge practices that will gradually multiply the facets of science and related knowledge practices in Sri Lanka. The first section of the novel ("Sarath," Ondaatje 2000, 5–72) has Anil form a cautious collaboration with Sarath Diyasena, an archaeologist who was trained and works in Sri Lanka. They are given a work base on a "transformed" former "passenger liner" (14) now "berthed permanently" and used by Kynsey Road Hospital to supplement its constrained lab resources; and the detailed description, positioned early in the novel, of their allotted "storage space and work lab, claustrophobic, the odour of Lysol in the air" (15) as they move in, taking precautions against the rats that also inhabit the ship, throws into relief global disparities in funding, equipment, and working conditions for scientists. But in Kynsey Road Hospital, she also occasionally has access to a workspace that she recognizes: a place where she can "now and then [...] use better equipment" (62), a place of the kind that feels like "home" (63) to her: "God, she loved a lab" (62).

At first, the collaboration of a forensic pathologist with an archaeologist may look, as Sarath declares, like “an odd pairing, in my opinion” (13). Given their particular line of investigation, however, this soon turns out to be a very productive combination. Together, Anil and Sarath will examine human remains exhumed at ancient sacred burial sites that are now government-protected archaeological excavation areas, and they will seek to determine whether the bones found are those of ancient monks buried in a sacred site or those of victims of political murders hidden among the sacred remains. When they do find four skeletons that appear to have been recently reburied in the archaeological site, the goal becomes to find clues to their original burial sites and to establish the identity of at least one of the four victims, whom they designate as ‘Soldier,’ ‘Sailor,’ ‘Tinker,’ and ‘Tailor’. Their collaboration will make visible in superimposed layers the deep cultural history and the recent violent conflict in Sri Lanka.

The text records the initial uncertainty on Anil’s part about whether Sarath’s role is to support her investigation or to control and limit it. He, for his part, appears to be made wary, both by the implied arrogance of her perspective as an outsider and by her privileged family background and surviving relatives connected to the government. As the novel unfolds, however, the complex and growing relationship of trust between Sarath and Anil will sustain and drive the course of the narrative until just before the end of the novel.

In order to make progress in their investigation, they require additional expertise which can only be provided by other local partners in science. But they also need to be cautious about whom to trust and whom to involve in their investigation, given its possible political implications. “No one else,” says Sarath when Anil suggests the need for geological expertise. But there nevertheless unfolds a chain of connections to scientists of different disciplines where trust seems possible: entomology, geology, archaeology, anthropology, botany. Sarath resists Anil’s wish to call in a local forensic geologist in order to help identify the soils from the original burial place that may still attach to the bones (48). Anil demurs and decides instead to consult Chitra, a female scientist whose paper on “pupae” (60) has impressed her. Chitra’s analysis will indeed provide a vital clue regarding first location and original burial place of ‘Sailor’s’ body (cf. 147–48), and she also explains how “some insects are attracted to bone, not flesh. [...] So there might be pupae remains from the first location. We could reduce the site possibilities by knowing the type of insect” (69).

The following three sections of the novel—“The Grove of Ascetics” (73–109), “A Brother” (111–53), and “Ananda” (155–201)—are similarly dedicated to the gradual but consistent widening of perspectives on science

and related knowledges in a range of different directions. First Sarath takes Anil to meet Palipana, once an impressive, exacting, and highly respected epigraphist and cultural archaeologist, and also Sarath's former academic teacher and mentor. We learn that Palipana "had made his name translating Pali scripts and recording and translating the rock graffiti of Sigirya" and that he "wrote lucidly, basing his work on exhaustive research, deeply knowledgeable about the context of the ancient cultures" (75). Lately, however, Palipana has lived in reduced and retired circumstances, having become the centre of an academic scandal about infringements of scientific integrity.

Having once been Palipana's student, Sarath approaches him in order to ask for help with reconstructing and modelling one of the victim's faces, based on the shape of his skull. Instead of suggesting a scientific contact, Palipana directs them to Ananda Udugama (cf. Section 4, "Ananda," 155–201), an artisanal craftsman and artist specializing in Buddhist rituals and a former contributor to Palipana's own historical work. Ananda's skill in modelling faces will deliver another vital piece of information, helping them to reconstruct a likely appearance from the victim's skeletal remains and ultimately contributing to the victim's successful identification.

Ananda's mode of work may not be exercised and formalized within the parameters of a scientific discipline or institution, but his skill and expertise produce results of equivalent significance. On the final pages of the novel, after Anil's departure, the scientific excellence of Ananda's practice, always carried out in the face and under the conditions of deadly political violence, is reiterated and emphasized. As Ananda prepares to carry out the ceremony of painting the Buddha's eyes, the narrative reverts to the time of his connections to international archaeological research projects. Under conditions that were safe for Western scientists, Ananda would have been 'subalternized' (Mignolo)—placed "under guidance and authority of foreign specialists" (Ondaatje 2000, 297):

[...] in the end these celebrities never came. There was too much political turmoil and it was unsafe. They were finding bodies daily in the adjoining fields. Victims picked up as far as Kalutara were brought here, out of family range. Ananda [...] gave two of his team members the job of dealing with the bodies—tagging them, contacting civil rights authorities. [...] Later it came to be seen that the work done by Ananda was complex and innovative. (Ondaatje 2000, 297)

The pervasive violence does more than mark the conditions under which scientific work will still be done by those who have no free choice of places

to be. It forces a rearrangement which places Ananda in a position of responsibility, allowing him to create output which gains retrospective recognition.

By the time that the narrative takes Anil and Sarath to encounter Ananda, it has already brought them face to face with the pervasiveness of acts of political violence in a very immediate form. Much of the novel's third section, "A Brother" (111–53), presents close-up contact with the spectrum of the medical expertise and medical science plentifully required by all sides in an armed conflict that has kept producing a steady series of injured victims and injured combatants from all sides ever since the "victims of 'intentional violence' had started appearing in March 1984" (114). Returning from Palipana's refuge, and before they can move on to contact Ananda, Anil and Sarath come across Gunesena, a victim of political violence, by the side of the road. Anil provides emergency medical treatment, and Sarath calls on another trusted scientific practitioner: his brother Gamini, who is a doctor in a hospital in Colombo. Gamini has gone through long years of working in emergency units—"“Gunshot Services,’ they called it” (124). The section offers extensive detail about medical work required from the doctors who attend to the victims, detailing types of wounds and operations, hours of work, physical and mental exhaustion, or the terrible experience of triage after bomb explosions.

In the spectrum opened up by the novel, this section contributes to positioning Anil's project of identifying the remains of the victims of political violence from the recent past, between the archaeological work in which Sarath is routinely engaged (and that kind of cultural archaeology practised by Palipana) on the one hand, and the present reality of political violence on the other. The sequence of close encounters with the range of scientific expertise present in Sri Lanka, which takes up a good two thirds of the novel, is therefore far from episodic. Instead, the various situations are connected not merely through the fact that Anil and Sarath encounter them as partners in the progress of their investigation; these successive encounters also serve to unfold both characters and, moreover, they gradually shift the novel's attention from Anil's web of human connections to Sarath's. The novel will not pit the two characters in opposition to each other. On the contrary, after a brief early phase of caution and mutual suspiciousness, their mutual loyalty takes root and grows, to the degree that they place the success of their investigation above the protection of their own safety and wellbeing. Sarath eventually sacrifices his life for the success of the investigation when he helps Anil rescue the evidence they have found from being destroyed by the government which has employed him. Yet he emerges not as the loyal indigenous side-kick who has aided

the Western scientist with his local knowledge but as a scientist who puts his scientific credo above considerations of political opportuneness and personal safety.

All the facets explored in the novel, diverse as they are, form part of the assemblage of science, and all are clearly shown to be socioculturally embedded. Emphatically, this does not imply that they are subalternized or indigenized in the narrative. In fact, in its representation of science, the novel not only carefully avoids but appears rather to distance itself from any categorizations that would classify knowledge practices by opposing the scientific as international, universal, and global against the indigenous, culturally embedded, and local. *Anil's Ghost* rather appears to insist that any manifestations of science and related knowledge practices will be culturally embedded or at least culturally inflected, and takes pains to invite its readers to recognize this.

Delinking Science and Cultural Hegemony

The pluralization of instantiations of science and related knowledge practices, which the previous section has retraced, is complemented by the text's *second* strategy, the *critical distancing against any bids to promote a cultural stereotyping of science*. This is brought to bear most prominently on the perspectives represented and adopted by Anil (and the problematization and revision of these perspectives may, by implication, perhaps also entail a problematization and revision of the perspectives familiar to an international, progressive, and educated Euro-American audience, at which the novel's publication by prestigious British and American publishing venues clearly is aimed). But this strategy of critical distancing equally operates against nationalist constructions of science propounded as foundations of alternative cultural monopolies. The pluralization of instantiations of science and related knowledge practices in the novel goes together with the discrediting of any claims to correlate science with bids for cultural hegemony.

In the situations and reflections in which we encounter her in the novel, Anil herself does not actively propagate an opposition between Western science and local or indigenous knowledges. Her articulation of a sweeping contrast between Western humanitarianism vs local conflict and violence remains situationally conditioned. But her position in a geopolitical grid of scientific practice and humanitarian discourse, as indicated at the beginning of the previous section, might be considered as sufficient

grounds for an initial anticipation that these oppositions will frame the plot that is going to unfold.

It might, in fact, appear at the outset as though the novel is setting up a 'returned migrant' narrative with a scientist protagonist. This trope in its characteristic form is reminiscent of European Naturalism, where it tends to be employed as a means of representing the clash between a metropolitan modernity and an outdated traditionalism linked to a provincial locality. There is, in fact, a range of postcolonial science novels in which the figure of the 'returned migrant scientist' is invoked, though rarely in the 'naturalist' mode of a mutual unmasking of modernity and tradition (cf. Kirchhofer 2022, 314–15).

But while this culturally coded literary pattern is invoked, it is neither foregrounded nor validated. We do find out for instance what Anil appreciates about living in 'the West,' but this is more by way of a passing remark, and the topic is soon forgotten in a detailed discussion with the Sri Lankan entomologist helping her narrow down the possible locations of the original burial of 'Sailor.' In fact, most of Anil's 'backstory' is presented in passing, interspersed in a passage which focuses on her experiences as a science student and practitioner in various international settings. Her brief, misguided marriage with a young man from Sri Lanka during the first year of her study in Britain, which led her to seek greater distance from a social setting where she feels unappreciated; her father's medical expertise and her parents' death in a car accident; her brief interlude as a prizewinning swimmer; and, most strikingly, her purchasing her name from her brother are the main pieces of Sri Lankan backstory about her. But none of these is centrally linked to the conflicts and contradictions that currently trouble Sri Lanka, and none produces a meaningful confrontation with her past and the history of her family and connections. Instead, as the plot unfolds, we gradually find out a good deal more about other characters' family histories—Sarath's family history above all, as we (and Anil) learn the story of Sarath's failed marriage, or about Sarath's childhood relationship with his brother Gamini who has always been overlooked ("The Mouse," Ondaatje 2000, 203–27). Ananda's family relations are presented, too: his autodestructive mourning for his murdered wife, from which his artistic work is a way of saving him. These family stories, to which Anil comes in the role of witness (282), make visible the intricate links between the individual lives and the troubled state in which Sri Lanka finds itself.

The novel may open with a perspective closely aligned with Anil's, but it does not by any means maintain an exclusive alignment with her perspective. If Anil remains a central character, it is also because the sequence

of encounters occasioned by her assignment and her collaboration with Sarath provide a sequence of opportunities to call into question the exclusiveness of her perspective. This happens, as has already been outlined, in the indirect way of pluralizing instantiations of science and related knowledge practices, which resolves the cultural exclusiveness implied in the cultural stereotyping of 'science' as Western into a range of culturally inflected instantiations of science from which the Euro-American instantiations differ only in the specificity of their cultural and geopolitical positions. It also happens in a much more direct manner. Her most confidential encounters are shot through with explicit challenges to that perspective. Early on in the narrative, while they are still in the process of testing how far they can trust each other, Sarath points out to Anil the role distribution implied by the structure of her assignment. "You can't just slip in, make a discovery, and leave," Sarath tells Anil, pointing out that her position is predicated on a script with preassigned roles which reproduces a conventional media bias that fails to truly engage with the situations on which an investigation may be focused: "[Y]ou'll be like one of those journalists [...] staying at the Galle Face Hotel. That false empathy and blame" (40).

And just before the end of the novel—in fact, only once Anil has left Sri Lanka with the evidence preserved by Sarath at the cost of his life—she recalls Sarath's brother Gamini pointing out, again, the cultural imbalance in the narrative pattern that frames her presence in Sri Lanka:

'American movies, English books—remember how they all end?' [...] 'The American or the Englishman gets on a plane and leaves. That's it. The camera leaves with him. He looks out of the window at Mombasa or Vietnam or Jakarta [...] The tired hero. [...] He's going home. (Ondaatje 2000, 282–83)

Perhaps, in order to make the point harder for readers to miss, Gamini is also made to spell out the generality of this pattern: "That's enough reality for the West. It's probably the history of the last two hundred years of Western political writing. Go home. Write a book. Hit the circuit" (283).

Anil does not deviate from the role that is pre-assigned to her in the cultural script. But while she completes the plot trajectory associated with her original project, she also recalls these words, spoken in a conversation between the two brothers and her. The novel makes a considerable effort to invite readers to recognize the shortcomings and the structural imbalance on which this established conventional pattern is predicated, and to align their perspectives with the highly critical view articulated by Sarath

or Gamini. The significance which the novel attributes to these statements is not generated by detailing Anil's thoughts and reactions to it at the time; but these statements constitute the last passage which the novel devotes to Anil—a passage, moreover, which is the last that gives Anil the function of focalizer, and in which Anil “a long time later” (282) wonders about her choices and remembers those words.

But when Anil leaves, the novel itself does not follow. Instead, the perspective remains with the continuing violence in Sri Lanka, on which the outcome of the investigation has no direct bearing, and with the characters who continue their lives, and their work in science and related knowledge practices, under those conditions: Gamini and Ananda.

The encounter with Palipana is particularly relevant in this context, for several reasons. Palipana not only figures as an additional facet in the spectrum of science in Sri Lanka; he represents a programmatic counterstance to the cultural stereotyping of science associated with a European or Euro-American perspective on global science: “While the West saw Asian history as a faint horizon where Europe joined the East, Palipana saw his country in fathoms and colour, and Europe simply as a landmass on the end of the peninsula of Asia” (75). Palipana's programmatic reversal of the culturally predominant perspective in scientific outlook is paralleled at the institutional level with an early withdrawal from the Western dominated circuits of international science:

The 1970s had witnessed the beginnings of a series of international conferences. Academics flew into Delhi, Colombo or Hong Kong for six days, told their best anecdotes, took the pulse of the ex-colony, and returned to London and Boston. [...] Palipana [...] went to one such gathering, and never went to another. (Ondaatje 2000, 75)

But Palipana does more than pursue a strategy of ‘provincializing Europe’ by proposing a scientific paradigm that is no longer predicated on the supposition of Euro-American cultural hegemony. Palipana mounts a counterclaim to cultural hegemony: “The main force of a pragmatic Sinhala movement,” he “was for a number of years at the centre of a nationalistic group that eventually wrestled archaeological authority away from the Europeans” (75). But while Palipana's presence in the novel forms a counterpoint to a kind of Euro-American cosmopolitan science in which Western scientists exert discursive supremacy (with which Anil is partly aligned through her training and institutional affiliation), his own position also becomes legible as a bid to link science and cultural hegemony, with which the novel does not align itself. In spite of his reputation for rigorous

and meticulous scholarship, built up over long years of research, Palipana is discredited for his later publications, when certain stunning “discoveries” of his are revealed to be forgeries (cf. 76–78). Palipana’s historical and archaeological research, the results of which had evidently chimed well with the requirements of a cultural outlook closely linked to Sinhala nationalism (and, thus, to a highly partisan position in the conflict over the construction of the relative shares of the Buddhist/Sinhala and the Hindu/Tamil components in Sri Lanka’s history and cultural identity)² culminates in an act of forgery, which may not have appeared as a “falsehood in his own mind” but, rather, as “the last stage of a long, truthful dance” (77). But the blurring of the boundaries between scientific research and cultural politics is not endorsed by the text. Instead, the presentation of Palipana also underlines that the novel’s distancing strategy operates in relation to any form of a cultural stereotyping of science, not merely to the predominant one.

Again, it is Sarath with whose position the text seeks to align the reader. The critical account of Palipana, as well as the initial appreciative introduction to his work and position, are presented through the voice of an unindividualized external focalizer, a voice which occasionally also informs the reader about Sarath’s attitudes. Thus, we learn of Sarath’s admiration for a mentor who had “consistently challenged [him] during his academic years for crimes of laxness and inaccuracy” but equally of the sense of “betrayal” (78) that he shares with other admirers when they learn of the forgeries.

The novel’s critical distancing from a Western cultural stereotyping of science, sweeping and placative in the passages relating to Palipana and more individually tailored in the complex relationship between Anil, Sarath, and Gamini, is carefully guarded from becoming an endorsement of alternative cultural stereotypings. Instead, it will be the recognition of individual and situational inflections of scientific practice that emerges from the structural entanglements of plot and character in the novel. And the character whose practice illustrates this is Sarath—Anil’s *ghost*.

2 For a critique of the proposals of a scientifically validated type of cultural nationalism in Sri Lanka, cf. Rambukwella (2018).

Towards a Postcolonial Cosmopolitan Science?

The fact that the novel closes with Ananda and the Buddha ceremony has sometimes been read as an embrace of a Sinhalese cultural monopoly on the question of Sri Lanka's postcolonial national identity (on this point, cf. Goldman 2004; Kanaganayakam 2006). But even though it is Palipana who points Sarath and Anil towards Ananda, Ananda's position in relation to science and culture is vastly different from that of Palipana. In Ananda, as has already been shown, we encounter kinds of knowledge and practice that will be recognized as "complex and innovative" (Ondaatje 2000, 297), although paradoxically, as I have indicated above, it takes precisely the conditions of violence and unsafety produced by the civil war to allow Ananda's expertise to appear and be recognized, and prevent it from being delegitimized by being 'subalternized.' At the same time, Ananda's work is a far cry from Palipana's attempt to will a cultural truth into existence, which involves a version of science that seeks alignment with a claim for cultural hegemony. Ananda's goal is not "to celebrate the greatness of a faith" but to maintain his distance from the ubiquitous violence of war, from "demons, spectres of retaliation," for Ananda "knew that if he did not remain an artificer he would become a demon" (300).

Once Anil has left, the novel's focus remains on Sarath, Gamini, and Ananda, the culmination of the third textual strategy, working to *establish and profile an alternative, culturally and geopolitically sensitive perspective on science*. Gamini and Ananda continue their respective work under the conditions of ongoing violence and war. Sarath pays the price for helping Anil get away with the evidence they have found together. His dead body, bearing the marks of elaborate tortures, ends up with many others in the emergency unit where Gamini works, and is tended and mourned by Gamini in "a pietà between brothers" (285). Like Sarath and Gamini, Ananda's life and work has been spent "on this borderland of civil war among governments and terrorists and insurgents" (286). All three have "searched out and found their own dominions. Sarath in sundrenched fields looking for astrological stones, Gamini in his medieval world of Emergency Services" (286), Ananda in his work as an artificer. The significance of Sarath's death is less connected to the preservation of 'Sailor's' skeleton and the self-sacrifice that ensures the successful completion of Anil's assignment. In its closing sections, the novel loses sight of these aspects, never following its effects on their shared discovery, and focusing instead on the persistence of Sarath and his particular scientific faith in the thoughts and practices of those closely associated with him: for Gamini, there is "the beginning of a permanent conversation with Sarath" (285);

for Ananda, the knowledge that “[h]e and the woman Anil would always carry the ghost of Sarath Diyasena” (301).

Sarath’s scientific outlook is presented very clearly and extensively as Anil and Sarath’s investigation draws towards a close, in one of the comparatively rare passages infused with Sarath’s perspective:

There are images carved into or painted on rock [...] that have altered Sarath’s perceptions of his world. Years ago, he and Palipana entered unknown rock darknesses, lit a match and saw hints of colour. [...] These were discoveries made during the worst political times, alongside a thousand dirty little acts of race and politics, gang madness and financial gain. War having come this far like a poison into the bloodstream could not get out.
[...] Half the world, it felt, was being buried, the truth hidden by fear, while the past revealed itself. (152)

As with Ananda, we encounter here the specific interweaving of the internationally fuelled destructive violence of civil war with the thrill of archaeological discovery, which provides an extreme variation on the general phenomenon of a culturally inflected universal that is the situated manifestation of the emergent global assemblage that is ‘science.’

Anil would not understand this old and accepted balance. Sarath knew that for her the journey was in getting to the truth. But what would the truth bring them into? It was a flame against a sleeping lake of petrol. Sarath had seen the truth broken into suitable pieces and used by the foreign press alongside irrelevant photographs. [...] As an archaeologist, Sarath believed in truth as a principle. That is, he would have given his life for the truth if the truth were of any use. And privately [...], he would, he knew, also give his life for the rock carving from another century. (152–53)

As we know, Sarath ends up giving his life not for a rock carving but for the truth that Anil has been seeking. But his scientific ethos is tied to an instantiation of ‘science’ that forms part of the global assemblage, just as much as any instantiations of science that emerge and are situated in other “milieus” (Ong 2016). The irresolvable tension between the universal and the situated that is constitutive of the specific existence of the global assemblage of science becomes palpable in Sarath’s scientific credo and practice, as much as in the spectrum of other instantiations of science in whose context this is placed. This account of science is validated and endorsed by the textual structures of the novel—not as the only possible one but as the one which this particular scientist embraces and which is


as valid and 'scientific' as any of the other accounts whose more or less far-reaching claims of validity we encounter in the novel.

The perspective on science and related knowledge practices emerging from *Anil's Ghost* is emphatically one in which 'science' is never independent of the cultural and geopolitical conditions under which it is practised. The novel's perspective on science does not seek to ignore or disavow the impacts of these frameworks on the conditions under which scientific practice occurs, whatever individual characters may be seen to say or think; and neither does it declare any of these frameworks to be the only valid and possible ones, claiming a monopoly on science for one of its cultural and geopolitical inflections. Instead, it embraces the work and practice of science under the conditions under which it is possible in a given historical, cultural, and geopolitical setting. The character who stands most for this perspective is not Anil but her Sri Lankan fellow scientist, who navigates her through the multiple versions and instantiations of science that they encounter together in the course of the novel. In the end, it is the local scientist Sarath, Anil's 'ghost,' who arguably emerges as the normative centre of the novel. Instead of a cultural stereotyping of science, the novel exemplifies and endorses a view of the work and practice of science which is sensitive to the conditions under which it is possible at a particular juncture, in a certain historical, cultural, and geopolitical setting.

Within the spectrum of the postcolonial science novel, *Anil's Ghost* is remarkable for the painstaking guidance of the reader towards these insights, and for the prominence and textual detail in which the three narrative strategies that I have identified are elaborated and foregrounded. The strategies themselves—the narrative resistance to the cultural stereotyping of science; the narrative's insistence that a certain cultural inflectedness is part and parcel of scientific practice as well as of other, related knowledge practices; and its focus on the representation of science and knowledge practices in settings other than the more conventional Euro-American contexts—appear to occur, with more or less emphasis, across the spectrum of the postcolonial science novel. Among the examples I have briefly invoked prior to my reading of *Anil's Ghost*, it would appear that Ghosh's novels place a greater emphasis on the co-production of scientific knowledge in the encounters and interfaces between Euro-American 'science' and knowledge practices that appeared to lie beyond it. Novels such as *Serious Men* or *Helium*, as much as they may differ from each other, place a greater focus on the specific modes and conditions of scientific practice in frameworks of a specific postcolonial society. *Anil's Ghost* stands out through the range of scientific fields and of related knowledge practices

that are integrated in the narrative trajectories of the novel. It stands out, too, through the power with which its main narrative trajectory, centred around the relationship between Anil and Sarath and amplified through the intensity of their numerous scientific and personal connections, does not merely offer a sustained critique of the conventional cultural stereotyping of science but also serves to establish and profile an alternative, culturally and geopolitically sensitive perspective on science.

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Entangled Modernities and Locations of Knowledge in Amitav Ghosh's Science Novels

ABSTRACT “Modernity was not a ‘virus’ that spread from the West to the rest of the world,” Amitav Ghosh writes in his treatise on literature and climate change, *The Great Derangement*. It is, rather, a “global and conjectural phenomenon,” and what is unique about Western modernity is only “its insistence on its own uniqueness” (2016, 95). Throughout Ghosh’s work, his plots unearth the disparate roots and entangled trajectories of multiple modernities. This includes Ghosh’s science novels, *The Hungry Tide* and *The Calcutta Chromosome*, which demonstrate that the notion of science as a uniquely Western form of knowledge production is a colonial construction. At first glance, both novels seem to position indigenous, colonial subjects as preter- or even supernatural sources of knowledge: in *The Hungry Tide*, an illiterate fisherman’s intimate understanding of river dolphins and their movements through the Sundarbans delta occasions a scientific breakthrough for the novel’s cetologist heroine; and in *The Calcutta Chromosome*, a cult-like conspiracy of Indian “counter-scientists” are portrayed as the puppet masters behind Roland Ross’s discovery of the transmission of malaria in colonial India. However, on closer inspection, in both novels, the positioning of colonial subjects as the Other of scientific knowledge production is subverted: *The Hungry Tide*’s illiterate fisherman is not a font of ancient local knowledge, he is a patient observer who looks at the dolphins with scientific precision; *The Calcutta Chromosome*’s shadowy conspirators are not keepers of occult knowledge but are working within and through the laboratories of colonial scientists to do their own original research. Like modernity, then, science has many roots and entangled trajectories in Ghosh’s fiction.

KEYWORDS Amitav Ghosh, science, subaltern knowledge

The Dark Hemisphere

In his most recent book, *The Nutmeg's Curse*, Amitav Ghosh combines his preoccupation with the cultural repercussions of global environmental hazards with his interest in hidden and forgotten histories of colonial violence and postcolonial modernity.¹ The history of the nutmeg—and the colonial trade in the precious spice—serves, as per the book's subtitle, as a “parable of a planet in crisis.”

Like a planet, a nutmeg too can never be seen in its entirety at one time. As with the moon, or any spherical (or quasi-spherical) object, a nutmeg has two hemispheres; when one is in the light, the other must be in darkness—for one to be seen by the human eye, the other must be hidden. (Ghosh 2021b, 10–11)

The inciting incident of the book's argument is the Dutch East India Company's violent dispossession and displacement of the indigenous people of the Banda Islands, then the single source of nutmeg, in 1621. To Ghosh, this is a paradigmatic moment for the colonial practices of extraction that have ultimately led to the current climate crisis. The hidden hemisphere of the nutmeg thus signifies the unacknowledged colonial history of the modern world. But the nutmeg subsequently also becomes an epistemological metaphor that signifies the limitations of scientific knowledge, a *pars pro toto* for a world that science alone cannot adequately understand:

The modern gaze sees only one of the nutmeg's two hemispheres: that part of it which is *Myristica fragrans*, a subject of science and commerce. The other half eludes it because it will only manifest itself in songs and stories. And in today's stories and songs there is no place for the nutmeg; it is merely an inert object, a planet that contains no intrinsic meaning, and no properties other than those that make it a subject of science and commerce. (Ghosh 2021b, 35)

Much of Ghosh's work seeks to recover what is hidden from the modern gaze in this dark hemisphere. Many of his novels focus on the forgotten and deliberately obscured colonial histories of global capitalist modernity—the Indian Ocean slave trade in *In an Antique Land*, the teak and rubber commerce in *The Glass Palace*, or the opium trade in the Ibis trilogy. And

1 The author gratefully acknowledges the support of the Volkswagen Foundation in funding the research for this contribution.

throughout his work, we find instances where these histories of colonial capitalism touch the question of scientific rationality and its relationship to other forms of knowledge—from the misguided rationalist utopianism explored in *The Circle of Reason* to the globetrotting exploration of the climate crisis in *Gun Island* and his non-fiction books, *The Great Derangement* and *The Nutmeg's Curse*.

However, the metaphor of the two distinct hemispheres, evocative as it is, could also be read as a deceptive oversimplification about what kind of knowledge is located where: the light of European rationality here, the murky world of myth over there. But Ghosh himself stresses that scientific observation and modern technology are not the exclusive domains of the European metropolis; an indigenous industrial revolution in nineteenth-century South Asia, for instance, was preempted by the force of colonial armies, not by a lack of technological expertise and scientific literacy in Asia. “Modernity was not a ‘virus’ that spread from the West to the rest of the world,” Amitav Ghosh argues in *The Great Derangement*. It is, rather, a “global and conjectural phenomenon” (2016, 95); what is unique about Western modernity is merely “its enormous intellectual commitment to the promotion of its supposed singularity” (103).

In this paper, I will focus on two of his novels that are overtly and centrally concerned with science and knowledge production: *The Hungry Tide* and *The Calcutta Chromosome*. I read both texts as science novels: rather than being an incidental part of the texts’ setting, science forms a central thematic concern of both novels and a crucial part of their commentary on colonial and postcolonial modernity.² Both novels focus on a confrontation between a Western or Western-trained scientist with other, indigenous, forms of knowledge—that hidden hemisphere receding from the modern gaze. Here, Ghosh’s metaphor is equally instructive and misleading as a way into these novels. Both texts seem to set up the encounter in oppositional terms, as confrontations of science with its others: quantifiable scientific data versus the practical, local knowledge of the indigenous informer in *The Hungry Tide*; enlightened scientific practice

2 Kirchhofer and Auguscik define science novels as texts that “variously involve scientist characters, they are set at least partly in scientific institutions or laboratories, and they present emplotments of science by integrating scientific conceptions, problems or practices into the structures of their plots” (Kirchhofer and Auguscik 2017). This kind of emplotment, Gaines, Farzin, and Haynes add, provides a “fictional space for slow, contemplative, nuanced thinking about the socially and economically contingent power of science to both illuminate and transform nature and to both mitigate and generate social change and risk” (2021, 11–12).

versus occult, gnostic mysticism in *The Calcutta Chromosome*. As Robbie Goh points out, such a dichotomy, which would cast “science as the villain of the piece and the source of oppression,” is emancipatory to a degree but also problematic in that it retains colonial taxonomies of knowledge. “Therefore even discourses which seek to excoriate science and its acts of power perpetrated on racial and cultural others stand in danger of replacing and replicating those very acts” (Goh 2011, 57–58). However, a closer look at both novels shows that they proceed to subvert these structural oppositions and depict the advancement of scientific knowledge as a process deeply entangled with forces and knowledges outside the traditional purview of science. This will become especially clear once one pays attention to the location of knowledge in the novels—by which I mean both where knowledge production takes place in the diegetic world of each novel and the use of narrative perspective as the location of textual knowledge production. Opting against a conventional chronological ordering of the novels, I will first turn to *The Hungry Tide* (2005) and explore how this comparatively realist text explores the relationship between ‘local,’ ‘indigenous’ knowledge and globalized science. I will then use a critique of *The Hungry Tide* as a springboard into *The Calcutta Chromosome* (1995), which uses elements of science fiction and fantasy to imagine an inversion of the unequal exchange between indigenous knowledge and global science. While this may implicitly position *The Calcutta Chromosome* as the more open, aesthetically challenging, or politically subversive text, I will argue that *The Hungry Tide*’s position and role in Ghosh’s overall body of work complicate this contrast.

Inscrutable Depths: *The Hungry Tide*

Ghosh’s 2004 novel *The Hungry Tides* has become a focal point of postcolonial environmental criticism (see, for instance, Mukherjee 2010; Weik 2006) and has often been identified as a precursor of Ghosh’s later, explicit engagement with climate change (see Trexler 2013; Kluwick 2020). The novel focuses on Piya, a marine biologist tasked with conducting a survey of marine mammals in the Sundarbans, a wetland area in the Bay of Bengal, on the border of India and Bangladesh, characterized by an ever-shifting landscape of estuaries and mangrove forests. On the train to the area, Piya meets Kanai, an enterprising Delhi-based translator visiting his aunt, who runs a local charity. By accident, Piya winds up alone on a small fishing boat with Fokir, an illiterate local fisherman, and his small son Tutul. Piya has Bengali parents but grew up in the US and does not

speak Bengali, so she and Fokir cannot communicate verbally. Nevertheless, Fokir is able to take Piya to a population of Irrawaddy dolphins, whose unusual behavioral patterns promise a scientific breakthrough for her. After spending a day out on the river, they return to the island of Lusibari, where Kanai's aunt Nilima runs her charity. Here, Piya organizes a second expedition to gather more data on the Irrawaddy dolphin population, this time including both Fokir and Kanai, who is to act as a translator between them. The expedition ultimately ends in tragedy when Piya and Fokir are isolated from the rest of the group and caught in a cyclone, which only Piya survives because Fokir shields her with his body from flying debris.

At first glance, the tripartite constellation of Piya, Kanai, and Fokir suggests three different locations of knowledge and, moreover, three different kinds of knowledge: a native informant who draws on experiential knowledge and a trove of local mythology that saturates the landscape with meaning and, thus, knows where to find the object of scientific interest; a translator who has the linguistic knowledge to mediate this information; and, finally, a scientist, who conducts observation and measurements to transform local reality into data that then forms the basis of scientific discourse.³

To this we can add the kinds of spaces that characters move in and the narratological function they fulfill: Fokir is unequivocally associated with the river as a space; "he feels out of place" anywhere else (Ghosh 2005, 133) and seems to prefer being out on the river alone to being in the company of other fishermen (84). Kanai comes to the Sundarbans from Calcutta and is part of the globalized economy—he subsequently spends most of the narrative on the island where his aunt runs a hospital and a school around which a small town has sprung up. Associated with the land, urbanity, and the globalized world, Kanai finds that "[t]his is not my element" (334) when he joins one of Piya's expeditions on the river. Piya also comes from a metropolitan background, but like Fokir, she prefers being out on the river alone. Nevertheless, Piya's trajectory over the course of the novel oscillates most between the river and the island of Lusibari. This back-and-forth between land and water mirrors a suggested romantic rivalry between Kanai and Fokir, but it also positions Piya as a mediator

3 Cf. Huttunen's reading of the character constellation: Huttunen reads Kanai as "representing the commodification of Indian languages affected by global industries," Piya as "symbolizing the suppression of Indian languages" in favor of scientific data, and Fokir as "a mediator between man and nature" who "is instrumental in making both Piya and Kanai transcend their discursive ontologies" (2012, 128).

between the human realm on land and the largely human-less, water-logged world of the Sundarbans (Gurr 2010, 75). On the level of narrative discourse, however, the novel oscillates between Piya and Kanai, who serve as the novel's focalizers; and for most of the novel, the narrative alternates between their perspectives. Fokir, and the knowledge that he brings to the scientific process, are continuously filtered through the perspective of two outsiders to the Sundarbans community—and through the epistemologies that their perspectives are informed by.

Thus, the novel seems comprehensively organized around three characters and three different types of knowledge embodied by them (scientific, linguistic, and experiential/ecological). But Ghosh establishes this constellation only in order to later undermine its neat separation. First of all, as I have already mentioned, for its first half, the novel focuses on Piya and Fokir alone on a boat, cutting out the translator as the middleman between the scientist and her 'local informant.' And Piya and Fokir get along just fine: while their communication is perfunctory and often fraught with the possibility of misunderstanding, their collaboration in finding the population of dolphins and then exploring and measuring their habitat works surprisingly well. This is, at least in part, because Fokir breaks the mould of what one would stereotypically expect from a mere local guide or informant. As Piya explains to Kanai:

"[B]asically that's all I do—I watch the water. Whether I see anything or not, it's all grist for the mill: all of it's data. [...] For a long time nothing happens, and then there's a burst of explosive activity and it's over in seconds. Very few people can adapt themselves to that kind of rhythm—one in a million, I'd say. That's why it was so amazing to come across someone like Fokir. [...] It's like he's always watching the water—even without being aware of it. I've worked with many experienced fishermen before but I've never met anyone with such an incredible instinct. It's as if he can see right into the river's heart." (Ghosh 2005, 267)

Fokir does not represent 'traditional' or 'indigenous' knowledge, nor is he 'merely' a local guide or informer; his knowledge about the river dolphins' migratory patterns is not something that he has passively acquired. Indeed, having arrived in the Sundarbans as a refugee from Bangladesh when he was still a child, Fokir is a first-generation immigrant—as are virtually all of the ostensibly 'local' characters in the novel (see Bartosch 2013, 107–8; Mukherjee 2010, 182–83). Rather than knowledge handed down through tradition, his understanding of the river dolphins' migratory pattern is the result of active observation, which the passage above explicitly compares to the specialized scientific labour Piya performs.

While the narrative thus suggests a similar aptitude for scientific observation in Piya and Fokir, it also posits a parallel between Piya and Kanai—at least in Kanai's perception:

Minutes later she's back in position, with her binoculars fixed to her eyes, watching the water with a closeness of attention that reminded Kanai of a textual scholar poring over a yet-undeciphered manuscript: it was as though she were puzzling over a codex that had been authored by the earth itself. He had almost forgotten what it meant to look at something so ardently—an immaterial thing, not a commodity nor a convenience nor an object of erotic interest. He remembered that he too had once concentrated his mind in this way; he too had peered into the unknown as if through an eyeglass—but the vistas he had been looking at lay deep within the interior of other languages. (Ghosh 2005, 269)

Focalized through Kanai, this passage reproduces a number of clichés about science—as a disinterested, idealist pursuit; as reading the book of nature; as a penetrating gaze into the depth of things—that the novel's otherwise discerning, ethnographic look at the minutiae of Piya's research undercuts. But the passage also temporarily levels the distinction between different forms of knowledge. Piya's and Fokir's observation of the river dolphins and Kanai's study of languages are here juxtaposed as experiences of immersive curiosity beyond economic, political, or personal entanglements.

Central to the description of this experience is the metaphor of depth—Fokir looks into “the heart of the river” while Kanai explores the “interior” of languages. Indeed, the relation of depths and surfaces is both a central motif and a structuring device for the novel, but usually, depths remain hidden beneath the surface. The forest often appears as “a barrier, like a screen or a wall,” obstructing visual observation (Ghosh 2005, 125). As Laura Wright notes, “the landscape confounds the ability of the human eye to oversee and compose order; the movement of the tides and the trees continually shifts the eye's relation to the land, preventing the single point perspective that is necessary for linear mapping” (Wright 521). Piya's research can be understood as an attempt to understand what is going on under the surface of the river. However, the river, like the forest, mostly remains a visually impenetrable depth. When Piya, a practised swimmer, falls into the heavily silted river, she is so disoriented that she almost drowns in the “eerily glowing murk” of the water (Ghosh 2005, 54).

It is not merely the environment that remains inscrutable: Fokir, the principal character associated with the river, similarly remains a depth unprobed. The early chapters in which Piya and Fokir are alone out on

the water in particular are full of observations of surfaces, as the narrator offers exhaustively minute descriptions of Fokir's gestures and activities, filtered through Piya's perception. Piya constantly wonders about what any particular action means and what Fokir is thinking at any given moment:

What was he thinking about as he stared at the moonlit river? The forest, the crabs? Whatever it was, she would never know: not just because they had no language in common but because that was how it was with human beings, who came equipped, as a species, with the means of shutting each other out. The two of them, Fokir and herself, they could have been boulders or trees for all they knew of each other: and wasn't it better in a way, more honest, that they could not speak? (Ghosh 2005, 159)

Even later in the novel, when Kanai is nominally available as an interpreter, we get little more insight into Fokir's thinking. While we, as readers, get a sense of a complex personality guiding his actions, this interiority remains hidden from us, and Fokir thus remains something of a cipher. This is compounded by the fact that both Kanai and Piya project their own values and assumptions onto him: Piya sees "a muscular quality of innocence" about him (Ghosh 2005, 99), while Kanai sees him as an uneducated simpleton who could never be his or Piya's equal (268). Returning time and again to inscrutable depths and untranslatable meaning, the narrative can be read as calling into question the notion of translatability itself (Griffiths 2012, 112). If we read the novel as an attempt to give voice to the contribution of indigenous knowledge in the scientific process, then this narrative distancing is a striking admission of its own limitations, its own inability to 'translate' the voice of the subaltern knowledge producer into the discourse of the Anglophone novel.

This is all the more striking since, on the formal level, *The Hungry Tide* seems to be very much invested in translatability. *The Hungry Tide's* narrative voice uses standard English, Bengali terms are often immediately glossed in English, and Kanai sometimes laboriously explains untranslatable puns or nuances of meaning from Bengali (for instance, Ghosh 2005, 212). The narrative is told in an "integrating voice [that] provides coherence and explanations that are particularly necessary for readers unaccustomed with the cultural sphere the story narrates and, thus, enables a dialogue" (Bartosch 2013, 115). Rather than performing a sense of alterity through the use of abrogated or hybridized English, *The Hungry Tide* is conspicuously *explaining* alterity. While its characters constantly deal with moments of untranslatability and murky, inscrutable realities, the narrative discourse itself strives to be a completely transparent medium of communication.

These conflicting impulses, I would argue, also inform the novel's problematic ending. While they are out on the river, trying to locate the dolphin population, Piya and Fokir are caught in a cyclone. In the novel's dramatic climax, Piya loses the data she has collected over the course of the plot when the storm blows away a backpack with her data sheets, but survives the storm, while Fokir dies shielding Piya from flying debris. However, after what seems like a tragic ending, the novel's epilogue concludes the novel on a markedly more optimistic note. It turns out that the data wasn't lost after all: Piya's and Fokir's movements searching for the dolphins on the river were recorded by her GPS-tracking device. Fokir's knowledge about the dolphins' patterns of movement is thus converted into satellite data. Piya is able to leverage this data into funding for further research, which she plans on conducting in collaboration with the local community, involving local fishermen in the conservation efforts. She even hires Fokir's widow to help her run the administration of the project. Within the span of just five pages, the epilogue provides a whiplash reversal of fortune in a *deus ex machina*—actually, *data ex machina*—ending. Clearly, Piya's encounter with Fokir really proves transformative for her, and her intensified engagement with the community can be read as a model for a more locally embedded and reciprocal practice of science in a postcolonial context. But the narrative also repeats the very erasure Ghosh seems to want to overcome: once the local knowledge of the native informant has been converted into hard data, the informant is expendable—and, sure enough, the narrative disposes of him.⁴ Thus, the epilogue may read as somewhat forced because it attempts to reconcile two contradictory impulses in the novel: an ethical impulse to give voice to indigenous epistemologies and a reflexivity about its own potential shortcomings in mediating these epistemologies to a global audience—the danger of opening them to projections, to romanticization, and oversimplification. It is this ambivalence about the communicability of subaltern knowledge and experience—even when it is integral to the progress of 'Western' science—that also informs *The Calcutta Chromosome*.

4 Cf. Li (2009), who similarly detects "a sacrificial logic" in the novel: "Kusum and Fokir, as 'authentic' subalterns who resist and remain heterogeneous to hegemonic modernity, die so that their stories can be recounted and memorialized by literate, modern characters" (290).

Subaltern Hauntings: *The Calcutta Chromosome*

Subtitled “A Novel of Fevers, Delirium and Discovery,” *The Calcutta Chromosome* presents a sharp contrast to the realist aesthetics of *The Hungry Tide*. Borrowing generic elements from science fiction, the thriller, and the ghost story, the novel presents an alternative, conspiratorial counter-narrative of Ronald Ross’s discovery of the transmission of malaria in colonial India from 1895 to 1897. The novel alternates between two timelines, the first of which is set in a near-future New York and focuses on Antar, an Egyptian-born researcher, who catalogues archival items with a global networked computer system. When his work turns up an old ID card by one of his former colleagues, archivist and historian Murugan, Antar is spurred on to recollect Murugan’s idiosyncratic theory concerning Ross’s discovery. Murugan’s hypothesis is that Ross’s success was secretly engineered by a cult-like indigenous conspiracy, engaged in what he calls “counter-science” (Ghosh 2010, 103). Their aim, Murugan believes, was achieving immortality through “interpersonal transference,” i.e. a chromosomal migration of personality “from body to body” (106–7). The second timeline focuses on Murugan as he travels to Calcutta in 1995, where we already know he will eventually disappear without a trace. Murugan meets and teams up with two journalists, Urmila and Sonali, to uncover evidence of the continued activities of the counter-science conspirators.

Twice mediated—as Antar’s recollection of Murugan’s narrative—the novel opens up a counter-history of Ross’s research that undercuts the (self-)construction of Ross as a divinely inspired “knight of science” crusading against the scourge of malaria (Taylor-Brown 2014). Drawing on Ross’s own writing as well as on letters and documents from other contemporaneous colonial researchers, Murugan polemically depicts Ross as an incompetent amateur who is unknowingly steered by Indian lab assistants: “‘What gets me about the scenario is the joke. Here’s Ronnie, right? He thinks he’s doing experiments on the malaria parasite. And all the time it’s him who is the experiment on the malaria parasite’” (Ghosh 2010, 78).

In Murugan’s account, the secretive group that guides Ross’s research is principally represented by two figures. One is a young man calling himself Lutchman, who first volunteers as a test subject for Ross and later becomes his indispensable lab assistant, manoeuvring him towards crucial research steps; the other is an older woman called Mangala who works ostensibly as a cleaning woman in the lab, but who seems to wield some hidden authority over the other Indian lab assistants and over the scientific work in the laboratory itself. The novel points out that both seem inconspicuous to their colonial overlords because they inhabit

the lowest rungs of colonial society—Lutchman is said to have been a “dhooley-bearer” and Mangala a day labourer recruited by her British employer at Calcutta’s Sealdah railway station. Their exact identity remains fuzzy and fluid throughout the novel; their motives and intentions are only surmised by Murugan and Antar. Relegated to the margins of colonial texts, these figures become a sinister if not supernatural force in Murugan’s account, part of a conspiracy that dabbles both in advanced microbiology and in occult practice. The novel intimates, but never completely confirms, that both characters—or reincarnations of them—return both in Murugan’s research trip to Calcutta in 1995 and in Antar’s near future New York.

Throughout the novel, then, this “counter-science” emerges as the inverted mirror image of science, which is here specifically coded as a Western, colonial practice. Western science in the novel is pursued by knowable historical subjects—either real-life scientific figures in colonial medicine, such as Ross, Patrick Manson, and D. D. Cunningham, or fictional characters that are nevertheless historically documented within the diegetic world of the novel, such as the linguist J. W. D. Grigson and a young American missionary doctor called Elijah Farley. Meanwhile, counter-science is pursued by “slippery,” shadowy subjects, whose identity and motives are a matter of conjecture and whom the reader gets to know only through multiple layers of mediation (Lutchman through Murugan’s interpretation of Ross’s writing, as remembered by Antar [Ghosh 2010, 73–78]; Mangala through an AI-generated reconstruction of an uncatalogued letter by Farley [126–28]). Western science is depicted as a public “narrative of expertise” (Jolly 2022, 287) and revolves around a logocentric practice of the naming of scientific objects and thus, implicitly, taking possession of them. By contrast, counter-science is obscure, secret, and undocumented. Murugan’s hypothesis is that the group uses “secrecy as a technique or procedure” and deliberately refuses claims to know because “to know something is to change something” (Ghosh 2010, 103). At first glance, the opposition of science and counter-science, a central thematic throughline of the novel, would seem to reinscribe, perhaps deliberately and ironically, Orientalist stereotypes of Eastern opacity, superstition, and deceitfulness.

Indeed, some of the descriptions of “counter-science” in action seem to suggest such Orientalist fantasies: in 1894, Farley chances upon a ritual gathering when he visits a Calcutta laboratory at dusk and furtively observes Mangala “seated on a low divan, but alone and in an attitude of command, as though enthroned,” surrounded by syphilitics “in various attitudes of supplication, some touching her feet, others lying prostrate”

(Ghosh 2010, 149). In 1995, Sonali observes a similar ritual, although, again, the description of the ritual is furtive and incomplete (164–66). It is tempting, then, to read the location of different forms of knowledge in the novel as an oppositional geography of scientific knowledge and its “counter-scientific” inversion, an opposition that neatly maps onto the distinctions between West and East, metropole and colony, power and subalternity. But on closer inspection, the novel’s structuring opposition between Western science and its opposite is not strictly dichotomic but, rather, an entangled duality, a structure already implied in the titular figure of the chromosome (cf. Fendt 2015).

This entanglement is manifested in the use of space in the novel: Mangala’s counter-scientific group does not occupy its own spaces; there are no secret temples or underground lairs. It operates instead within the marginal spaces of the colonial scientific enterprise itself: its gatherings take place in antechambers and outhouses of colonial laboratories, in ruined hospital yards, and in Ross’s abandoned “Europeans only’ board- inghouse” (Ghosh 2010, 79).

The physical proximity of science and counter-science emphasizes that, despite its cult-like trappings and the aura of the fantastic and the uncanny that surrounds Mangala and Lutchman, counter-science is not mystical or primordial knowledge, not “a native, mythologically based knowledge” separate from the discourse of science (Fendt 2015, 180). Nor is it quite accurate to describe their project of “interpersonal transference” as “a scientific investigation into Hindu reincarnation” (Shinn 2008, 146). Indeed, the novel does not discuss a connection with Hindu beliefs in reincarnation at all. Presumably, Lutchman and Mangala would be subaltern outsiders in the social hierarchy of the Hindu caste system just as much as in the colonial social order. As Suparno Banerjee has pointed out, the novel “does not employ classical Hindu mythology or invoke traditional Vedic knowledge. Rather, the book also subverts established Indian epistemology” (2010, 58). Ghosh thus also avoids a conflation of scientific and Vedic concepts that has taken root in recent Hindu-nationalist discourse.⁵ As Murugan theorizes, counter-science is not traditional or ancient knowledge; like science, it is the outcome of an active investigatory process, a form of scientific labour:

5 See Nanda (2016) and Subramaniam (2019) for trenchant critiques of this discourse.

Let's say that just about the time that Ronnie's beginning to work on malaria there's this other person—this team—that's also been working with *Plasmodium falciparum* but in a different way; a way so different it wouldn't make sense to anyone who's properly trained. But let's say that by accident or design they've made a certain amount of progress; they've taken their work to a certain point and then they've run smack into a dead end: they're stuck, they can't go any further—because of glitches in their own methods, because they just haven't got the right equipment. [...] they've got to find a conventional scientist who'll give it a push. (Ghosh 2010, 104)

Not only does it seem that Mangala and Lutchman are clandestinely utilizing the work of European researchers, but the conspirators also seem more than willing to deploy state-of-the-art technologies and infrastructures to advance their aims, from the laboratories of colonial epidemiologists to the sophisticated, artificial-intelligence-powered computer network that Antar works with in the novel's near-future narrative. What differentiates counter-science from science, then, is not that it is “unscientific” in how it generates knowledge; the point of distinction is its seeming incommunicability and invisibility. While the conspiracy always seems to be near the centres of colonial knowledge production, it is also always just out of view. This is underlined quite literally, as encounters with the group's gatherings and actions are accompanied by moments of impeded or distorted vision: Elijah Farley first observes Mangala's direction of other laboratory assistants in a glass reflection, “mirrored on the convex surface of [a] glass tumbler” (142); later, he catches glimpses of a ritual-like gathering from behind a closed door (148–52); Sonali's discovery of a similar gathering is impeded by dense clouds of heavy smoke—so much so that she can barely keep her hurting eyes open (164–66). The impossibility of the novel's Western and Western-educated characters getting a clear look at counter-scientific practice reflects the inability of these characters to view non-Western sources of knowledge and expertise unclouded by their own biases. It may also reflect the novel's inability to articulate subaltern knowledge in the form of the Anglophone novel (with all its colonial baggage and generic blinders).

The novel underscores this by complementing the oppositional constellation of colonial scientists and subaltern counter-scientists with a third group of characters and a third location of knowledge generation: Murugan, Antar, Sonali, and Urmila are all postcolonial investigators trying to piece together the truth about the connections between the other two groups. While the scientists and counter-scientists work in the laboratory, these investigators' work is in the archive; rather than in experimentation

and observation, their work is in reading.⁶ Sometimes, they are interpreting physical evidence, but very often it is literally through the reading of journals, letters, and stories that they seek to generate knowledge—knowledge that would itself take the form of a narrative to logically connect all the mysterious and sometimes fantastical elements they encounter. The structure evokes a kind of literary detective fiction that Suzanne Keen (2003) has called “romances of the archive.” However, instead of working out a cogent historical narrative of what ‘really’ happened in Ross’s laboratory, the past is resistant to their quest for meaning-making, “an unstable zone of deliberate coverups and still-active conspiracies” (Keen 2003, 226). At the end of the 1995 narrative, Murugan, Urmila, and Sonali set out for a remote small-town train station that they suspect to be a centre of the counter-science conspiracy. We know from Antar’s part of the narrative that Murugan disappears at this point; the fate of Sonali and Urmila is unclear. Antar, in turn, becomes increasingly feverish and his perception increasingly unreliable as he unearths more clues of the conspiracy and Murugan’s fate. He eventually enters a virtual reality simulation (apparently uploaded to his computer system by the conspirators before Murugan even began investigating the matter) in which he experiences a scene from early in the 1995 narrative through Murugan’s eyes. A chorus of ominous voices then assures him “We’re with you; you’re not alone; we’ll help you across” (Ghosh 2010, 306). Like Ross, Antar, the ostensible subject of knowledge production and discovery, turns out to be the object of manipulation, “his subjectivity apparently co-opted by the objects of his research, who have sought him out in the first place” (Keen 2003, 227).

In their attempt to make sense of these different embedded narratives and intertexts, Murugan, Urmila, Sonali, and Antar are aligned with the readers of the novel. The four ‘detective’ characters also serve as focalizers for the events of the novel, aligning the reader even more closely to their experience—like them, the reader “is forced to put clues together on his/her own in order to construct probable conclusions” (Hoydis 2011, 157). Just like these characters, the reader is propelled to read on by the desire for a solution to the mystery of the counter-science conspiracy that never comes. There is no final moment of epiphany; Murugan, Urmila, and Sonali go missing and their perspective disappears from the narrative,

6 In a second narrative strand of *The Hungry Tide*, Kanai fulfills a similar role. While reviewing the papers of his deceased uncle, he uncovers the involvement of Fokir’s mother, Kusum, with a community of refugees who had settled on the island of Morichjhāpi in the Sundarbans. The factual, but largely forgotten, history of the settlement ends in tragedy when police evict the settlers from the island in a brutal massacre that claims Kusum’s life and leaves Fokir orphaned.

while Antar's narrative ends in a disconcerting *mise en abyme* that seems to conflate Murugan and Antar but leaves the latter's fate open. Rather than pulling the work of the counter-scientists from the "dark hemisphere" of subaltern history, the literary detectives disappear into it, and the reader's quest for meaning-making is frustrated.


Beyond Closure

The Calcutta Chromosome thus presents the relationship between institutionalized science and other forms and locations of knowledge as a disruptive haunting, an encounter of science with its uncanny other. As with *The Hungry Tide*'s Fokir, there are silent subaltern subjects at the centre of the plot, whose capacity for knowledge production initially goes unnoticed. But unlike Fokir, Mangala and Lutchman resist efforts to codify their knowledge into Western terms. While *The Hungry Tide* provides an all-too-neat narrative closure when Fokir's understanding of the river dolphins' movements is turned into published scientific knowledge, *The Calcutta Chromosome* eludes such closure. The novel foregoes resolving its central mysteries: how the counter-science group operates, whether certain characters are 'really' the reincarnation of Mangala and Lutchman, or even if the group 'really' exists or is just a product of Antar's feverish imagination in the middle of a fatal malaria relapse. It is, as Claire Chambers argues, a novel that rejects the notion of a central truth, providing instead a network of "stories that contain layers of mystery, but have no real revelation at the core, like an onion which has nothing in the centre" (Chambers 2009, 46). The novel thus ultimately represents a refusal by Ghosh to speak for the novel's subaltern subjects, to reduce them to knowable objects of someone else's discourse (see Banerjee 2010, 52). Their counter-scientific knowledge production remains within the "dark hemisphere" of modernity, obscured not only from the novel's colonial scientists but also from the readers and their literary stand-ins, the detective figures Antar, Murugan, Sonali, and Urmila. While this disrupts the "sacrificial logic" (Li 2009, 290) by which the subaltern becomes expendable once their knowledge is translated into Western knowledge, it also relegates them to the shadows, not an articulated presence in the history of modernity but a haunting on the edges of discourse.

I have read the novels against their chronological order to highlight this contrast more clearly, yet this reshuffling also suggests reading *The Calcutta Chromosome* as a critique of *The Hungry Tide* *avant la lettre*. However, this risks imposing its own narrative closure on the two texts by privileging the

unknowability of subaltern knowledges and subjectivities in *The Calcutta Chromosome* as the more subversive and radical approach. This also provides a solution for the wicked problem of Anglophone postcolonial literary criticism—who can speak for the subaltern and how to speak for it in the language of the colonizers. Placing the two texts in the overall body of Ghosh's work indicates that he, for one, is not satisfied with the simplicity of this solution. Indeed, while I have criticized the abrupt resolution of *The Hungry Tide*, in Ghosh's larger oeuvre, it is *The Calcutta Chromosome* that is the closed text, while the setting and characters of *The Hungry Tide* are an ongoing literary project. The Sundarbans are a major touchstone in his treatise on literature and climate change, *The Great Derangement*. In *Gun Island* (2019), Ghosh revisits the central characters and places, the ecological and social conflicts in the Sundarbans in the larger context of the global climate crisis, as well as in a history of migration and cultural exchange that ranges from the Middle Ages to contemporary climate migration (see Kluwick 2020; Wilton 2021). In *Jungle Nama* (2021a), Ghosh retells the legend of Bon Bibi, a mythological figure in the Sundarbans whose story problematizes environmental exploitation and greed—providing, potentially, another “parable of a planet in crisis.” In the context of the environmental crisis especially, the relationship between science and other knowledges is entangled and ambivalent. As Ghosh, reflecting on *The Hungry Tide*, notes, science is the indispensable interpreter “that allows the environment to speak back to us,” but at the same time, “science cannot be the final arbiter in the matter of our relationship with Nature, for the very good reason that its procedures and methods cannot acknowledge or address questions of meaning, intention and lived history” (2017, 22). Like the shifting landscape of the Sundarbans, the complex trajectories of science and its entanglements with other forms of knowledge in a globalized, colonial modernity perhaps defy the strictures of a single text or even a single genre and call for dialogic encounters of different texts, genres, and perspectives instead.

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Resentment from Below: Manu Joseph's *Serious Men* as a Subaltern Prism on Indian Modernity

ABSTRACT Based on a thematic analysis, we propose a sociological reading of Manu Joseph's *Serious Men* that explores the relationship between modern science and Indian society. The novel reflects, among other aspects, on the Janus-faced impact of the institutionalization of science and higher education in modern India from a subaltern perspective. In that regard, Joseph's contemporary story of lower-class Dalits offers at least two interpretative angles: on the one hand, a hegemonic position of collision avoidance as incumbent forces redirect the organization of science to preserve the traditional social order; and on the other hand, a subaltern position that attempts to break the wheel of social stratification as characters excluded from institutional positions of power exercise their agency to manipulate the political strife within their workplace. In the first reading, the autonomy of science degrades into social irresponsibility; in the second, the autonomy of science is used, for right or for wrong, as a weapon against multiple structures of oppression. From both angles, the novel deconstructs the conventional view of an autonomous science as a self-evident ideal of India's postcolonial modernity.

KEYWORDS caste, Dalits, India, Indian writing in English, science in society

Over seventy years after India's independence, largely democratic and republican forms of government, the rule of law, and inclusive policies have not only failed to undermine the grip of traditional hierarchical structures, but have also contributed to the emergence of new forms of stratification that continue to shape Indian society. The caste system, in particular, persists across nearly every facet of Indian social structure, perpetuating both overt and covert hierarchies. Caste, as a contemporary phenomenon, manifests along multiple codependent dimensions: as a

traditional status hierarchy organized around ascribed notions of purity and pollution, as a constitutive element of social and political power in everyday life, and as a system that institutionalizes practices of discrimination and violence (Jodhka 2018, 5–15). Manifest and latent forms of caste-based discrimination are deeply embedded in India's traditional institutions. While there are competing narratives on whether caste still matters in modern Indian society, many argue that caste disparities—intertwined with other forms of social exclusion based on, for example, gender, ethnicity, or class—also permeate in its modern institutions (Desai and Dubey 2012; Mosse 2018, 425–31), including those operating in the fields of science, education, and technology.

In line with many of their counterparts across the globe, Indian science and higher education primarily position themselves as catalysts of economic development, often subordinating academic freedom, institutional autonomy, and social responsibility to the imperatives of growth—thereby marginalizing their roles as spaces for basic research, critical inquiry, and potential political reform (Sundar 2018, 50). Nevertheless, Indian science continues to present itself as an autonomous, merit-based system that rejects identity-based exclusions such as caste or gender discrimination. To increase social mobility, the most educationally, politically, and socially disadvantaged castes and tribes—that is, Dalits and Adivasis, recognized by the Indian state as Scheduled Castes (SCs) and Scheduled Tribes (STs), as well as other disadvantaged castes officially termed Other Backward Classes (OBCs)—have been receiving substantial reservations in public employment and higher education for decades. But despite their rhetoric of merit and continued reservation policies, India's research and higher education institutions are “often found to be gated universes that are accessible largely to upper-caste, middle-class people in India” (Chadha and Achuthan 2017, 33). This lack of inclusivity, primarily entangled with caste and other systems of stratification, has significantly affected the social impact and, potentially, the productivity of India's science and higher education system.

Among modern forms of cultural production, pertinent Indian writing in English occasionally reflects on these phenomena by portraying Indian science as a social institution that links local and global identities while challenging distinctions between tradition and modernity in Indian society. In that sense, we propose a sociological interpretation of Manu Joseph's *Serious Men* (2011), grounded in an in-depth reading and a thematic analysis of the novel, to explore the relationship between modern science and Indian society. Joseph's novel is set in the fictional Institute of Theory and Research, a Mumbai-based center for basic and applied research in

the astronomical sciences. The story follows the main protagonist, Ayyan Mani, a Dalit assistant to the upper-caste Brahmin director of the Institute, Aravind Acharya. Acharya, along with Oparna Goshmaulik—an astrobiologist and the only female scientist at the Institute—is searching for evidence of extraterrestrial life. He frequently clashes with the Institute's deputy director, Jana Nambodri, a radio astronomer who seeks to direct the Institute's research toward his own area of expertise.

The story traces various political, cultural, and institutional discords within Indian science, as Mani and Goshmaulik—who are socially and professionally marginalized along different axes—attempt to manipulate these tensions and assert their individual agency. Caste and class conflicts shape Mani's marginalization, while Goshmaulik, despite matching or even surpassing the research contributions of the Institute's senior scientists, regularly faces challenges due to her gender. The Institute, a fictional representation of a prototypical Indian science institution, also participates in the merit-versus-reservation debate that shrouds Indian science and higher education policy. In its social realism, *Serious Men* illustrates the Janus-faced effects of the institutionalization of science in modern India from various subaltern perspectives. In that regard, our interpretation of Joseph's novel offers at least two interpretative angles:

- A hegemonic position of collision avoidance as incumbent forces redirect the organization and practice of science to preserve the traditional social order.
- A subaltern position that considers this subversion of the institution of science as an emancipatory act by local subalterns to overcome their marginal positions within both traditional and modern social systems.

In the first reading, the autonomy of science degrades into social irresponsibility; in the second, it is used as a weapon against multiple structures of oppression. Based on both angles, the novel deconstructs the conventional view of an autonomous science as a self-evident component of the package of postcolonial modernities (Bhambra 2023). The following sections provide background on social stratification and the institutionalization of science in modern India, establish a methodological foundation for employing fiction as a sociological tool, and explore *Serious Men* in light of theoretical and empirical research on caste- and gender-based inequalities in Indian science and society. As the novel thematizes caste and gender discrimination in both society and the institution of science, the discussion in the next two sections underscores the continuity between traditional and modern systems of social exclusion as well as the ongoing

underrepresentation of Dalits, women, and other marginalized groups in Indian science and higher education.

On Social Exclusion in Modern India

Any account of social stratification in India must acknowledge its variation and change. Rooted in a complex interplay of historical and contemporary factors, Indian society exhibits a wide diversity of social groups, cultural and religious practices, and both traditional and modern institutions. A distinctive feature of its social landscape is the predominance and hierarchical structuration of collective identities such as religion, caste, ethnicity, gender, and language (Béteille 1991b; Gupta 2007). The organization of hierarchies is continually negotiated and contested, both between and within conflicting communities across various social spheres. Two (post-) colonial developments, in particular, have reshaped India's traditional communal relations: first, the expansion of modern institutions such as secular legal systems, electoral politics, schools, universities, public health systems, and news media; and second—in part as an outcome of the former—the emergence of a substantial middle class, mass education, public spheres, and new professions (Béteille 1991a; 2015, 79).

This has resulted in an ambivalent configuration of traditional and modern parameters of stratification—specifically, how caste and gender relations co-produce educational and occupational opportunities (Velaskar 2016, 398). To understand how caste operates within modern Indian institutions, a few essential points about its underlying mechanics must be emphasized. What we commonly refer to as the caste system is rooted in one of Hinduism's foundational pillars: the *chaturvarna*, or the four-fold system of *varnas*. These *varnas* are hierarchically arranged, with Brahmins (priests) at the top, followed by Kshatriyas (soldiers), Vaishyas (traders), and Shudras (servants). Dalits—meaning downtrodden, broken, or crushed—are positioned outside the *varna* system as “the Untouchables, the Unseeables, the Unapproachables—whose presence, whose touch, whose very shadow is considered to be polluting by privileged-caste Hindus” (Roy 2016, 24). While *varnas* function primarily as conceptual categories, *jatis*—thousands of subgroups organized around lineage, kinship, and occupation—constitute the empirical manifestations of the *varna* divisions (Dharampal-Frick and Götzen 2014; Dharampal-Frick and Sitharaman 2015).

The caste system is postulated as operating on a sacred principle of graded distinction between purity and pollution, with the pure positioned

at the top of this hierarchical scale, endowed with privileges and the power to police those at lower levels—those deemed polluted. Because caste is primarily determined by birth and sustained through endogamous marriage practices, it functions as a social construct that entrenches marginalized caste groups in a perpetual cycle of status disadvantage and inequitable opportunity structures (Atrey 2019, 64). Accordingly, Bhimrao R. Ambedkar succinctly defines caste as “an enclosed class” (2004, 253) and an “ascending scale of reverence and descending scale of contempt” (2014, 167). Beyond being merely a traditional marker of cultural and social difference, caste matters significantly in contemporary India as a critical dimension that reinforces social, political, and economic power. Furthermore, caste institutionalizes social discrimination, humiliation, and violence (Jodhka 2018, 10–12).

Traditionally, the dominance of caste has been most evident in structuring communal and economic relations in rural India (Srinivas 1966). Moreover, caste has also become a crucial factor in modern Indian politics, particularly due to its differentiated national and regional party systems, public interest litigation, caste-based reservation policies, and the rise of Hindu nationalism (Jaffrelot 2021, 2–6; Teltumbe 2019, 364–66). However, there is less scholarly and political consensus on how caste operates within other modern institutions. Some argue that caste plays a diminished role in reproducing inequality in modern sectors of India’s economy, citing the perceived disconnect between caste obligations and professional responsibilities (Béteille 1991b, 25; 1996, 162). In contrast, others contend that upper castes—dominant in almost every social field in India—have transformed traditional caste capital into modern forms of social and cultural capital, thereby reinforcing historical caste hierarchies in contemporary contexts (Deshpande 2013). This transformation has rendered many modern organizations seemingly casteless while concealing latent casteist structures. Correspondingly, both conceptual and empirical evidence suggests the persistence of caste privilege in these institutions, often intersecting with gender- and class-based patterns of discrimination (Chakravarti and Krishnaraj 2018, 132–61; Islam et al. 2021).

On the Institution of Science in Modern India

The differentiation of substantial science and higher education systems is a paradigmatic feature of the social formation of modernity. Science is modern society’s principal means of producing and certifying new knowledge about the physical and social world—knowledge that is of epistemic

and, potentially, practical interest (Mavalankar 2014). Moreover, the social consequences of scientific research and education are closely connected to the political, cultural, technological, and economic development of modern societies. Although some scholars argue that India is still in the process of becoming modern and continues to articulate its own postcolonial trajectory (Gupta 2000, 217), its science and higher education institutions are largely modern inventions. While India has long been a center of knowledge production and higher learning, its first modern science and higher education institutions were established with the advent of the British Raj in the second half of the nineteenth century (Chakrabarti 2004; Prakash 1999; Raj 2007).

The expansion of Indian science and higher education into large-scale social institutions began after the country's independence in 1947, when local and national began aligning scientific research and higher education with long-term economic development goals (Arnold 2013; Sikka 1990). Since then, India has developed a highly compartmentalized system marked by sharp contrasts. Due in part to federal, regional, and functional differentiation, this system encompasses a wide variety of institutional types—ranging from research institutes deemed universities to several hundred (mostly public, some private) universities, most of which prioritize teaching (Padma 2015; van Noorden 2015). Relative to its size, India's research output remains modest; however, it hosts several research-intensive universities such as the Indian Institutes of Technology as well as prominent non-university research institutes, including the Tata Institute for Fundamental Research and the Indian Institute of Science, which produce substantial, internationally recognized basic and applied research. We consider these prototypical science organizations to be real-world references to the institute depicted in Joseph's novel.

Science and higher education have become core elements of India's package of modernity. In the process, its institutions have also adopted—at least rhetorically—varied conceptions of autonomy and social responsibility as ideal-typical prerequisites for the production and application of scientific knowledge (Grover 2020, 1889–90; Sundar 2018, 51). A fundamental dimension of any science system is its capacity to implement reward structures that incentivize scientific innovation and research quality while addressing specific basic and applied research problems (Stephan 1996, 1201–9). The margin of autonomy within the institution of science hinges on such structures to distinguish—based on self-contained intellectual criteria—good science from bad (Merton 1973, 134). Accordingly, productive research and education should primarily rest on merit, at least according to normative idealizations that are embedded in the institutionalized

self-image of many, if not all, modern science and higher education systems, including India's. Yet the concept and application of merit in science, higher education, and other institutions—built on the conviction that individuals deserve whatever rewards social markets bestow on their output—can have ambivalent consequences for the productivity, solidarity, equity, and equality of modern societies (Sandel 2020, 227).

In the context of Indian science and higher education, the notion of meritocracy implies that any system of marginalization not based purely on performance should be considered irrelevant—or even detrimental—to its functionality. However, most research on its social structure reveals that individuals with upper-caste, male, and middle-class backgrounds dominate these institutions, at least in numerical terms. At the same time, remarkably few individuals from the marginalized sections of Indian society appear to gain access to Indian science and higher education (Chadha and Achuthan 2017; Kondaiah, Mahadev, and Wahlgang 2017). Ethnographic, historical, and limited survey-based evidence also points to the persistence of caste-, gender-, and class-based discrimination among Indian researchers and their students (Pathania and Tierney 2018; Rathod 2021; Subramanian 2015; 2019; Sur 2011; Thomas 2020; 2021; Thorat et al. 2020; Tierney, Sabharwal, and Malish 2019). From a perspective informed by social and cultural studies, these findings prompt a turn to literary narratives and other forms of cultural production that illuminate how the marginalization of subaltern groups unfolds in Indian institutions of science and higher education.

On the Social Knowledge of Fiction

Using Manu Joseph's *Serious Men* to explore subalternity in modern Indian institutions rests on the premise that literary fiction can function both as a source and a tool for social inquiry. Therefore, our methodological starting point is the understanding that literary imaginations are produced by individual and collective perceptions. In particular, modern literary narratives that center on diverse social actors, actor constellations, and the structuring of social institutions may offer valuable sociological insights. To some extent, many approaches within cultural, literary, social, and postcolonial studies that incorporate literary texts into their analyses—whether explicitly or implicitly—share this standpoint (Misztal 2016). Our approach draws on the so-called strong program in the sociology of literature (Vána 2020), integrating the social knowledge embedded in works of fiction with postcolonial and sociological thinking. This allows us to treat fictional texts

as documents “with which to probe into reality, testing certain features of the world as described in the text” (Longo 2015, 140). Our methodological argument builds on the relationship between modern literary forms and society, literary fiction’s evolving engagement with modern science, and the social realism of contemporary Indian literature.

The scholarly potential of fictional literature rests on its context of production, the aesthetic quality of its communicative forms, and its engagement with and by the reader. In general, reading literary texts—whether for entertainment or for explicit analytical purposes—can involve experiences of recognition and enchantment, both through their aesthetic impact and their distinctive configurations of social knowledge (Felski 2008, 14). Like any cultural artifact, fiction is shaped by its aesthetic, cultural, and social contexts of production. It can, therefore, process knowledge of the social worlds in which it is embedded (Sevänen 2018, 52). However, fiction does not merely display existing knowledge. By linking manifest and latent observations with the logic of its aesthetic practices, writing fiction can also generate distinct forms of knowledge. These practices create imaginary blueprints of social worlds that both mirror and diverge from ordinary reality (Luhmann 2000, 129–30). Sociological perspectives such as ours treat literary narratives as thick ‘as if’ descriptions of society, offering space for reflection on empirically perceptible social realities (Koschorke 2018, 47; Vána 2021, 218–22).¹

The novel we examine belongs to a small but distinct segment of contemporary Indian writing in English that increasingly engages with various aspects of modern science and postcolonial India. More broadly, science has become a salient element in modern world literature (Roxburgh and Clayton 2021). Such fiction explores, for instance, the social and cultural context of scientific research, its impact on society, the lived experiences of researchers, and scientific concepts as crucial elements of the narrative (Gaines, Farzin and Haynes 2021; Pilkington 2019). Simultaneously, caste oppression, caste consciousness, and other forms of subalternity have been central themes in India’s various postcolonial literatures—whether in English, Hindi, or other vernacular languages (Gajarawala 2012; Thiara and Misrahi-Barak 2019). Particularly, Dalit literature—fictional, non-fiction, and autobiographical writing about Dalit protagonists, authored by Dalit writers—often exhibits a (self-)reflexive form of social realism (Gajarawala

1 In ethnography, ‘thick description’ refers to a specific mode of processing observations of social interactions and events. Its aim is to not only explain how something occurs but also interpret its meaning or significance (Geertz 1973, 9–10; Rubin 2021, 148).

2013, 164–65). These texts can be read both as a social history of caste elision and as a form of critique by Dalits and other subaltern groups. While *Serious Men* does not represent a classical form of Dalit literature, it centers on Dalit and other subaltern conditions in contemporary India.² It thus offers a distinctive literary imagination through which to rework the hegemonic logics of caste, gender, and class in Indian institutions of science and higher education.

A Literary Depiction of Subalternity in Indian Science

Even though *Serious Men* has received praise in Indian literary reviews (Sharma 2010) and was recently adapted into a Hindi-language film (Thakur 2020), literary scholarship has been more reserved, offering a somewhat critical perspective. This criticism revolves around the novel's allegedly problematic depiction of gender roles, the individualism of its Dalit protagonist, and a perceived lack of progressive politics (Yadav 2022, 314–16). Indeed, as the following analysis of the novel demonstrates, it deliberately foregrounds the ambivalence within progressive discourses of modernization and empowerment. It portrays a subversively assertive Dalit character who navigates and manipulates both privileged and subaltern figures to counteract India's overlapping traditional and modern systems of marginalization. In doing so, *Serious Men* links the hypervisibility of subaltern groups—particularly Dalits—with the alleged invisibility of upper castes, a social paradox that sociological and cultural studies of contemporary India continue to emphasize (Deshpande 2013, 32). Moreover, we argue that the novel's story, its character construction, and its satirical elements contribute to a distinctly realist portrayal of caste, gender, modern science, and contemporary India—precisely because it presents flawed protagonists, institutions, politics, and actions.

Serious Men can be read as a deliberate satire. Almost all—if not all—of its fictional events fall squarely within the realm of the familiar in postcolonial India, and precisely for this reason, Joseph's novel offers a resourceful literary imagination of what Gupta calls "India's mistaken modernity" (2000, 8)—a condition marked by the absence, thus far, of any meaningful transition from inequality among and within communities to equality both among communal groups and between individuals. As noted in the introductory section, the novel centers on Ayyan Mani, a Dalit man who works

2 As far as we know, the author of *Serious Men*, Manu Joseph, has not made his caste status public.

as a clerk at the Institute of Theory and Research, a fictitious astronomical research institute located in Mumbai. Both in his role as an administrative assistant to the Institute's director, Aravind Acharya, and in his everyday life, Ayyan is subjected to the panopticon of modern and traditional India's social, economic, and scientific hierarchies.

Mani lives with his wife, Oja, and their ten-year-old, partially deaf son, Adi, in a small one-room flat in a typical Mumbai chawl.³ He realizes that the gridlocked system of social exclusion will never allow him or his wife any substantial social, educational, or economic mobility. Recognizing that the game of stratification is rigged, he decides to rig it himself by falsely presenting his son as a child prodigy to improve Adi's educational prospects. His ulterior goal is for Adi to pass the joint entrance test (JET) of the Institute—an excruciatingly selective screening process for its highly prestigious undergraduate program. Mani's plan hinges on gaining access to the various versions of the test sheets, which contain hundreds of questions in physics, chemistry, and mathematics. After spending several nights searching nearly every room in the Institute for the well-secured question papers, he leverages his tacit knowledge of the Institute's internal affairs and collaborates with Acharya to obtain the JET templates.

Acharya, an upper-caste Brahmin and senior researcher more interested in basic than applied astronomical research, seeks to concentrate the Institute's resources on what he considers real science—specifically, the search for evidence of extraterrestrial microbes in Earth's stratosphere. However, other senior researchers are vying to replace him as director, including Jana Nambodri, the deputy director and a radio astronomer who aims to divert the Institute's focus from basic to more applied—and better-funded—areas of research aligned with his expertise. Completing this internal power constellation is Oparna Ghosmaulik, a young astrobiologist and the Institute's only female scientist, who seeks to advance her career and research interests. Acharya, along with several other male researchers, is enamored with her. Following a brief affair with Acharya, Ghosmaulik manipulates scientific data and strategically accuses him of research misconduct, leading to his removal as director and Nambodri's subsequent promotion. Throughout these events, Mani—by virtue of his status as a Dalit, a clerk, and a non-scientist—is an 'invisible visible' witness. His routine presence in closed-door situations goes largely unacknowledged by those in power, who disregard him on account of his

3 While generally characterized by poor sanitation and substandard living conditions, the tenants of such residential buildings often belong to the (lower) middle class.

institutional position and caste. Eventually, Mani forms an alliance with the disgraced Acharya, which enables him to obtain copies of the JET papers while helping Acharya reclaim the directorship of the Institute.

Questioning how different dimensions of subalternity intersect in contemporary India, we conducted an in-depth reading of *Serious Men* that resembles, in sociological terms, a thematic analysis and related forms of qualitative content analysis (Braun and Clarke 2006; Schreier 2017). Our analysis of the story focuses on the constellations between Mani, the Dalit man; Ghosmaulik, the young female scientist; Acharya; Nambodri; and other upper-caste, male, and senior scientists. First, we identified and reviewed relevant passages from the novel. These were then compared to uncover recurring themes and patterns that address our research question. The following sections present the interpretative angles of our analysis without claiming to offer a definitive exegesis of the literary text. Rather, we approach *Serious Men* as a literary prism through which we examine the complexities of caste-, gender-, and class-based discrimination in modern Indian science.

Caste: Merit Cannot Be Compromised

As a fictional representation of an Indian science institution, the novel's Institute of Theory and Research also reflects the merit-versus-reservation debate that permeates Indian science and higher education. Various forms of quota and affirmative action policies favoring marginalized communities—particularly those officially recognized by the Indian government as Scheduled Castes, Scheduled Tribes, and Other Backward Classes—have been a feature of India's social and educational policy at least since independence. At the same time, the Indian Constitution guarantees the right to equality, aiming to prevent discrimination on various grounds and to ensure equal treatment of its citizens in matters of public employment (Khosla 2012, 87–106). Some, including the Institute's senior researchers in the novel, argue that the principle of reservation contradicts egalitarian ideals, as it facilitates the social mobility of specific groups rather than benefiting society as a whole. However, the institutional objective of such policies is to equalize access to educational and occupational opportunities both between—and, when approached intersectionally, within—different communal groups.

Allocating research positions based on degree of social marginalization may certainly reduce the research output of the Institute—but only within a system that is genuinely structured around actual performance

and provides equitable access to educational, epistemic, and institutional resources, enabling all participants to compete on comparable grounds:

Matters slowly moved to another simmering issue: quotas for backward castes in colleges. There was a fear that the Institute of Theory and Research might be asked to allocate seats for the lower castes in the faculty and research positions. The general mood in the room turned sombre. Some men threw cautious glances at the secretaries and stray peons when there were comments on the political aggression of backward castes. Ayyan looked on impassively. He had heard all these arguments before and knew what their conclusion would be. The Brahmins would say graciously, “Past mistakes must be corrected; opportunities must be created,” and then they would say, “But merit cannot be compromised.” (Joseph 2011, 73)

No matter the injustices, the gated nature of the Indian science institutions ignores the deep-rooted social disparities within their walls while upholding the illusion of the fallible and often unquestioned ideal of uncompromisable merit. This literary perspective from within the institution aligns with ethnographic research on the Indian Institute of Science—one of India’s most productive research institutions in terms of publication output—which documents how scientists from Brahmin and upper-caste communities not only dominate various scientific professions and shape institutional culture along caste-based lines, but also often resist acknowledging the caste and class dimensions of their own dispositions and actions (Thomas 2020). These observations further underscore how, historically, science institutions, scientists, and science biographers have either dismissed the caste question or failed to take it seriously (Kondaiah, Mahadev, and Wahlgang 2017).

Unlike race, caste may not be immediately evident to those unfamiliar with Indian culture and traditions. Caste markers—framed within the pollution–purity matrix—can be found in names, professions, clothes, marriage and death customs, neighborhoods, and even the languages spoken. In contemporary India, caste asserts itself along three interrelated dimensions: as tradition; as a form of political, economic, and social power; and as an institutionalized system of discrimination and humiliation (Jodhka 2018). In *Serious Men*, the names of the male scientists serve as clear caste markers for Indian readers. The director of the Institute of Theory and Research, Aravind Acharya, bears a surname commonly found among Vishwabrahmin communities, which translates to ‘teacher’ or ‘guru’—occupations traditionally associated with upper-caste Brahmins. Similarly, his deputy, Jana Nambodri, has a surname that signals affiliation with Kerala’s feudal elite, the Namboodiri Brahmin community. Through

these unmistakably Brahminical surnames, the novel foregrounds caste identity and conflict as central to its narrative.

Mani's servility and submission are demanded by the scientists, who assert not only intellectual authority but also a moral, philosophical, and sacralized mandate:

Ayyan had a haunting desire to escape from this madhouse. Thirteen years was too long. He could not bear the grandness of their vocation any more, the way they debated whether universe must be spelt with a capital U or a small u, and the magnificence with which they said, after spending crores of public money, "Man knows nothing yet. Nothing." And the phoney grace with which they hid their incurable chauvinism and told reporters, "A physicist is ultimately judged through citations. She has to constantly publish." They were highminded; they secretly believed that their purpose was greater; they were certain that only scientists had the right today to be philosophers. But they counted cash like everyone else. With a wet index finger and a sudden meditative seriousness. (Joseph 2011, 29)

The novel presents instance after instance of scientists either openly asserting their caste identities by policing those they deem beneath them, or trivializing caste by ignoring its enduring grip on science—a field they portray as a singular force of truth through the offering, extension, or presentation of facts. Moreover, these leading members of the Indian astronomy community invoke flawed, refuted, and pseudoscientific theories of human intelligence and cognitive ability to justify their dismissal of Dalits as potential epistemic peers. The scientist Jana Nambodri, after a confrontation with the protagonist Ayyan Mani, exclaims to his colleagues:

"IQ of 148," the voice of Nambodri was saying. "If Dalits can have that sort of an IQ, would they be begging for reservations?"

"Did you see the way he was talking?" Jal said. "I can't believe this. That's what happens when you put someone who is meant to clean toilets in a white-collar job."

"He was in Mensa," Nambodri said, and there was a crackle of laughter. "Just because his son is some kind of a freak, he thinks even he is."

"Something fishy about his son," someone said. "I have never come across a Dalit genius. It's odd, you know."

The astronomers continued in this vein. They spoke of the racial character of intelligence and the unmistakable cerebral limitations of the Dalits, Africans, Eastern Europeans, and women. (Joseph 2011, 367)

Nambodri is surprised that a Dalit could possess a higher IQ than his own and dare to challenge his authority. His remarks reveal a deep-seated contempt

for Dalits, whom he associates with reservation policies and characterizes as “begging” for inclusion. His orthodox mentality displays a form of institutional protectionism, whereby he seeks to safeguard caste hierarchies by demeaning the subaltern’s attempts to challenge his authority—an authority he reinforces through references to ‘scientific’ metrics such as IQ and genetics. This mindset echoes broader discursive patterns in contemporary India and beyond that justify existing social hierarchies not only through appeals to tradition but also through ostensibly modern frameworks. In particular, several strands of Hindutva ideology combine the modern with the archaic, and scientific rhetoric with religious notions of indigeneity, community, and heritage (Subramaniam 2019, 7–10).

Aravind Acharya also shows little interest in the merit-versus-reservation argument and largely ignores the structural inequalities that plague the Institute. However, when directly confronted with the issue, his discomfort becomes apparent:

[Ayyan] always spoke in Tamil to the Director because he knew it annoyed him. It linked them intimately in their common past, though their fates vastly different. Ayyan’s dialect, particularly, distracted Acharaya. It reminded him of the miserable landless labourers, and their sad eyes that used to haunt him in his childhood when he watched the world go by from the back seat of a black Morris Oxford. (Joseph 2011, 51)

Compared to Nambodri, Acharya comes across as the lesser evil; yet the subtle markers of caste and class—evident in Mani’s particular Tamil dialect—make him visibly uncomfortable, as they recall a childhood guilt tied to witnessing poverty from behind the privileged windows of a chauffeured car.⁴ Acharya sees himself as pursuing a nobler path: science in its purest form, driven by curiosity and discovery—an ideal that echoes normative self-conceptions of traditional Brahmin occupations. Throughout the novel, his personal quest to discover extraterrestrial microbes and satisfy his scientific curiosity repeatedly clashes with the institutional and epistemic interests of his peers as well as the emotional needs of his family. Time and again, he chooses the pursuit of his own intellectual and professional concerns over interpersonal relationships and institutional responsibilities.

Finally, the novel’s primary subaltern figure, Mani, manipulates the ‘War of Brahmins’ to topple both the ignorant and the ignoble within the

4 Both being driven by a servant and the choice of car—a Hindustan Ambassador—serve as clear markers of Acharya’s upper-middle-class upbringing during the License Raj era.

Institute of Theory and Research. He watches as Acharya is removed from his directorial position. Later, he helps Acharya reclaim his role and clear his name—but only when he needs the scientist's assistance to secure access to the JET examination papers, allowing his son to cheat and be publicly recognized as a child genius.

Gender: Women in Science on the Margins

The other marginalized character highlighted in the novel is Oparna Goshmaulik, the only female scientist at the Institute. A young astrobiologist, Goshmaulik works with Acharya on a 'balloon experiment' aimed at detecting the DNA of extraterrestrial microbes. Within the Institute, both the other scientists and Mani view her through a sexualized lens, consistently overlooking her professional competence. She is acutely aware of the male gaze and frequently finds herself the subject of sexist banter, as well as offhand comments and behaviors from colleagues that contribute to a pervasive sense of discomfort in her workplace:

Some pretended to continue chatting while looking at her rear in respectful non-chalance.

"She is a Bengali?" a man intended to whisper, but the silence was so deep that everybody heard it. (The man probably was a Bengali.) Faint chuckles filled the air.

"Historically," Nambodri said aloud, "the only just punishment for a Bengali male has been a Bengali female." A round of laughter went through the room. "We forgot to mention it before, gentlemen, she is our first female faculty," Nambodri declared. (Joseph 2011, 70)

Oparna Goshmaulik is introduced as "almost beautiful in a deliberately modest cream salwar chosen to calm the men, she was an event" (Joseph 2011, 35)—a presence that Acharya and others at the Institute are consistently drawn to. For reasons not made entirely clear in the novel, she enters into an extramarital affair with Acharya, which ultimately contributes to his downfall when she publicly discloses the relationship alongside allegations of manipulated experimental data (Joseph 2011, 307–8). As the only female faculty member, Goshmaulik experiences persistent gender-based discrimination: She endures hushed remarks, is subjected to patronizing behavior, and frequently finds herself pushed to the margins of institutional life. Gender often appears as an anomaly within the purview of various scientific fields (Chadha and Achuthan 2017, 34). Yet it is not simply repressed as a silent facet of professional life: it is actively sustained as an anomaly, compelling those within these institutions to confront its

disruptive presence. Goshmaulik, as the anomaly within the Institute—nominally equal in authority and responsibility to her colleagues—is continually patronized and diminished by her male peers, who downplay both her presence and her legitimacy as a scientific equal:

The three walked down the interminable corridor. The woody sound of Oparna's heels was still so alien to the Institute, which was used to the unremarkable silence of men, that Acharya looked back at her and at her feet. She smiled meekly and tried to walk softly. That made her feel stupid, and, for a moment, angry with herself. She was not accustomed to being servile and she wondered why she was so in the presence of this man. [...]. She walked faster to keep up with him, and thought of something friendly to say, something equal. "This corridor is endless," she said. (Joseph 2011, 45)

Following the breakdown of her affair with Acharya, Goshmaulik manipulates scientific data and provides false testimony accusing him of malpractice. The blurring of personal and professional boundaries triggers a crisis within the Institute, as the two marginalized characters—Mani and Goshmaulik—assert their individual positions by leveraging the internal political conflict for their own ends. Although their interests converge around Acharya's eventual reinstatement as director, the novel makes clear—primarily from Mani's perspective—that Mani and Goshmaulik, both rendered subalterns for different reasons, inhabit fundamentally different social worlds. While Goshmaulik is marginalized on account of her gender, her upper-caste, upper-class background and professional status stand in sharp contrast to Mani's lived reality. Aware of her comparative privilege, yet simultaneously revealing his own gender bias, Mani fails—or refuses—to recognize any meaningful parallel between her struggles and the structural injustices faced by himself, his son, or his wife:

Ayyan was watching her surreptitiously as she stared thoughtfully at the door. Another high-caste woman beyond his reach. She went to the Cathedral School in the back seat of her father's car. Then onto Stanford. Now she was here: the Head of Astrobiology, the solitary queen of the basement lab. So easy it was for these women. Soon, some stupid reporter would write that she had "stormed the male bastion." All these women were doing that these days. Storming the male bastion. "Rising against the odds"—they all were. But what great subjugations did these women suffer, what were they denied by their fathers, what opportunities didn't they get, what weren't they fed, why were they so obsessed with their own womanhood? (Joseph 2011, 36)

But this lack of recognition for the marginalization of others is, to some extent, also shared by Goshmaulik—as illustrated in her first interaction with Mani: “She thought he smelled exactly like a room freshener. But at least he didn’t stink like other men” (Joseph 2011, 46). Thus, while both characters succeed in navigating and, to some degree, overcoming their own marginalized positions, they also reinforce the traditional social order of the Institute by enabling the return of a former upper-caste male director and facilitating the removal of his emerging upper-caste male rival. Throughout the novel, we are offered a perspective on intersectional subalternity within the institution of science in modern India—an institution that selectively adapts or discards traditional hierarchies according to convenience. In this homologous reading of Goshmaulik’s and Mani’s interactions, *Serious Men* explores the dynamic between sameness and difference in subaltern experiences of individual and collective disadvantage, shaped by their enduring inability to fully recognize and confront one another’s distinct forms of marginalization.

As a modern establishment, the Institute of Theory and Research is expected to deliver cutting-edge research and contribute to socio-economic development—in other words, economic modernization. It promotes a merit-based selection process, ostensibly allowing the “best of the best” to participate in scientific production. However, this ideal proves illusory, as the Institute’s unequal treatment of individuals from marginalized backgrounds effectively transforms it into a small, gated community. In Mani’s case, as a non-scientist, he emancipates himself by subverting the power structures of the Institute’s scientists without participating in the actual production of epistemic knowledge. Goshmaulik, by contrast, is a scientist who ultimately manipulates data and places blame on Acharya, leading to his removal as director. The novel does not explicitly disclose her motivations. On the one hand, her actions may stem from unresolved relational tensions with Acharya following the abrupt end of their affair; on the other, they may reflect a deliberate attempt to challenge the epistemic and institutional hierarchies that have marginalized her as a woman in a Brahmin-dominated space. Both Mani and Goshmaulik emerge as disruptive forces within the Institute, choosing reactionary strategies in response to their circumstances rather than accepting submissive roles.


Conclusion

The central theme of *Serious Men* revolves around how subalterns—such as Dalits and women—navigate and potentially ascend the social hierarchies of traditional and modern India. From this interpretative angle, Oparna Goshmaulik seeks to advance her research and career prospects at the Institute, while Ayyan Mani's prerogative extends beyond his own biography, as nearly all his actions are directed toward improving the educational opportunities available to his son. While taking their respective actions, both characters remain acutely aware of the structural disadvantages attached to their identities—Dalit and lower-class in Mani's case, and woman in Goshmaulik's—within institutions shaped by Brahmanical patriarchy (Arya 2020). While much of the scholarly criticism of *Serious Men* has focused on Mani's sexism and instrumentalism, we suggest that both Mani and Goshmaulik enact a form of subversive individualism that, given their differing positions within similar institutional and cultural contexts, appears not only intelligible but also justified. Our conclusion is informed by a postcolonial sociological perspective that approaches the novel not as a normative tale but as a critical narrative of the structural roadblocks embedded in contemporary Indian society.

In Goshmaulik's case, her research output alone does not determine her fate within the Institute—a social reality shaped by both modern and traditional forces. On the one hand, while reliant on collaboration, modern science is also an intensely competitive enterprise, constrained by a limited supply of rewards such as funding and tenure. This dynamic can negatively impact resource sharing, research integrity, and creativity (Fang and Casadevall 2015). On the other hand, Goshmaulik seeks to advance within a science system that operates as a microcosm of Indian society—one that remains, among other things, sexist, casteist, ableist, racist, and classist (Kondaiah, Mahadev, and Wahlgang 2017). Despite her privileged caste and class background, her gender becomes a significant impediment to career advancement in an institution dominated by Brahmin men. In contrast, the barriers Mani encounters—both within and beyond the Institute—are primarily rooted in caste and class, as India's reservation, social, and education policies have failed to adequately support marginalized castes and economically disadvantaged communities (Patel 2014). These challenges are further compounded by the current political dynamics in India, where the layered expansion of the Hindutva project has intensified the marginalization and violence experienced by Dalits in educational and other modern institutions (Thorat 2019, 221).

What is more, both Mani and Goshmaulik repeatedly witness how dominant figures within the Institute—such as Acharya and Nambodri—habitually exploit the institutional environment to control inclusion and exclusion. Given that both have been socialized in traditional and modern institutions that do not reward intersectional solidarity, their individualism and instrumentalism are hardly surprising. In the end, their subaltern assertions mirror those of the hegemonic forces and show little indication of cooperation that transcends immediate, instrumental, and individual gain. While their attempts to break the cycle of social stratification and exclusion may prove successful—at least in terms of their individual life trajectories (and, potentially, that of Adi)—their failure to foster any coalition or collaborative framework among different subaltern groups ultimately reproduces the entrenched social hierarchies of Indian science and society.

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“Our Doing and Undoing”: Anthropological Encounters and the Cultural Limits of Narrative in Lily King’s *Euphoria*

ABSTRACT Lily King’s novel *Euphoria* (2014) reimagines the 1931 American Museum of Natural History Expedition to the Sepik River in New Guinea, centring on the professional and romantic dynamics among fictionalized versions of the historical anthropologists Margaret Mead, Reo Fortune, and Gregory Bateson. This triangular constellation has garnered significant attention from reviewers. In addition, *Euphoria* has attracted interest from anthropologists due to its exploration of the discipline and its ethnographic methods. This paper examines the allegorical potential of King’s novel, which not only alters the names of the protagonists but also changes key factual elements of the expedition. Using various textual techniques, such as characterization, narration, and evocation of implicit readership, the novel captures different shifts in the field of anthropology’s history. While exposing the entanglement of science with colonialism and the ways in which ethnography is engaged in ‘doing and undoing’ subjectivities, lives, people, and cultures, *Euphoria* also grapples with the conventions of the adventure romance. This paper argues that the novel’s dual commitment—to advocating a postcolonial perspective while operating within the Western literary marketplace—prompts discussion of the cultural limits of narrative. Drawing on Mary Louise Pratt and Sara Ahmed’s critique of ethnographic texts, which often prioritize the agency of their knowing scientist subjects over the presumedly unknowing, indigenous ‘objects’ in anthropological encounters, this paper analyses *Euphoria* to acknowledge both the relevance of contemporary fictional reconstructions of historical scientific expeditions but also the complicities stemming from culturally specific scripts.

KEYWORDS anthropological encounter, ethnographic text, expedition narrative, Margaret Mead, the Pacific

“What is wrong with women? [...] Why do they buy into these cultural stereotypes? Worse, why do they perpetuate them? Are they not aware of the dominant female role in the hidden tribes of the Amazon? Is Margaret Mead out of print?” (Garmus 2022, 238).¹ The scientist protagonist in Bonnie Garmus’s bestselling novel *Lessons in Chemistry* is exasperated with the women around her. She finds them at fault for collaborating with, rather than resisting, the patriarchal status quo in 1960s US-America and for ignoring female scientists’ efforts to unleash the potential of female power in indigenous cultures in order to empower women in Western cultures. Here, and elsewhere, anthropologist Margaret Mead (1901–1978) and her findings about female adolescence, sexuality, and cultural roles have become a staple for female empowerment and cultural constructivism. The goal of this paper will not be to reconstruct the significance of Mead’s work but to ask what such (re)constructions reveal about the specifically Western contexts in which they are undertaken. What can literary narratives that use Margaret Mead as metonym—standing in for certain dilemmas in retrospectively reassessing anthropological research and its history, its practices, and its effects—contribute to understanding the ways in which ethnography and ethnographers are engaged in ‘doing and undoing,’ in making and unmaking subjectivities, lives, people, cultures?

Based on a reading of Lily King’s *Euphoria* (2014), which fictionalizes the historical 1931 anthropological expedition to the Sepik River in New Guinea with a Margaret Mead-inspired female protagonist, I will show that a discussion of this and other contemporary scientific expedition narratives can contribute critical reflections to an overarching debate about science, gender, and postcolonial narratives. As contemporary science novels, equipped with a characteristic “interdiscursive and meta-discursive dimension” (Kirchhofer 2021, 111), these narratives are in dialogue with distinct scientific disciplines but also exhibit their own culturally specific gaze. Literary and cultural representations of female scientists and explorers, at times fictionalizing historical figures such as Mead or inventing entirely new characters, effectively and importantly reimagine the role of women in science. Contemporary science novels such as Rachel Joyce’s *Miss Benson’s Beetle* (2020), which sends two female explorers in search of the eponymous insect on an expedition to New Caledonia in the Pacific in the 1950s, or Ann Patchett’s *State of Wonder* (2011), which substitutes

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the Conradian *Heart of Darkness* constellation of male protagonists in the Congo with female scientists in the Amazon, exude an acute awareness of the history of scientific collaboration with imperialist interests.

At the same time, novels with female scientist protagonists in post-colonial settings vary in the extent to which they pay attention to a differentiated account of specifically white female empowerment, at times celebrating female pioneership or sisterhood, in the laboratory or in the field, concomitantly with a neocolonial bias. As in Garmus's protagonist's evocation of "the hidden tribes of the Amazon" alongside Mead's name, the rewriting of the tropes of scientific knowledge production bears a certain risk of perpetuating, rather than refuting, the colonial myths of white, male, heroic scientists and adventurers. Scholars of neo-Victorian fiction have already noted the trouble with reimagining character constellations and settings reminiscent of the colonial adventure romance and its penchant for the figure of an innocent naturalist explorer (e.g. Boccardi 2016). In her examination of female rewritings of the topoi of exploration, Ann Heilmann views the work of specifically "feminist counter-narratives of nineteenth-century science" critically, as they "interrogate historical conceptualizations of racial and gendered hegemonies" but ultimately "do not overturn conventional dichotomies" (2014, 92). The problem to which I would like to draw attention does not rest with the individual female protagonist involved in scientific discoveries or the individual literary celebration of female scientists. I am interested in the novels' position between representing and communicating science, on the one hand, and the allurements of the literary marketplace, on the other. In spite of the often highly reflected intercultural ambition and goals, I will argue, the positionality of these narratives carries certain cultural scripts.

In particular, *Euphoria's* retelling of Mead's historical scientific expedition contributes to a body of texts which revisit the female anthropologist, anthropological fieldwork in the Pacific region with its methods of ethnography and participant observation, and the history of expeditionary practice in general. The novel participates in the reassessment of the potentially controversial female anthropologist's findings and their aftermath. Among others, the title of anthropologist Esther Newton's essay collection, *Margaret Mead Made Me Gay* (2000), attests to Mead's status as cultural icon and heroine of US-American liberal positions against sexism, racism, and homophobia. Yet Mead's work has also provoked professional criticism. In *The Making and Unmaking of an Anthropological Myth* (1983), New Zealand anthropologist Derek Freeman refuted her method and results. His critique prompted ethnographers all over the world to take sides in this so-called 'Mead-Freeman controversy,' resulting in camps of

defenders and critics of Mead's work, but also of Freeman's own approach and conclusions (e.g. Orans 1996). Despite well-grounded and authoritative attempts at clearing her name in public and popular scientific accounts (e.g. Horgan 2010), Mead's legacy continues to polarize. According to James Clifford, both anthropologists cast Samoan life as "scientific projects" and, thus, end up representing two sides of the same coin: "Mead and Freeman form a kind of diptych, whose opposing panels signify a recurrent Western ambivalence about the 'primitive'" (1986, 102–203). Crucially, the 'Mead–Freeman controversy' not only seems to have a strong gender bias but its setting and relevance are specifically Western.

Indeed, *Euphoria* resides in a long and often problematic tradition of artistic and literary constructions in which scientific interest—often commingled with sexual and colonial needs—rather than an interest in the local cultures takes centre stage. 'Outsider' perspectives on the 'south sea' region from Captain James Cook's travel accounts to Herman Melville's 1846 novel *Typee* to Paul Gauguin's paintings have produced imaginations of a paradisiacal Pacific, which are often reproduced rather than repudiated in ethnographic writing of the twentieth century, including Mead's own monograph *Coming of Age in Samoa* (1928) and subsequent publications. Tellingly, what these writings have in common is a conflicted desire to learn about as well as from what is perceived as primitive or pre-modern—more so, what is first constructed as primitive or pre-modern, then appropriated and finally destroyed; all in the name of preserving and accumulating. Such imaginations have been countered by scholars in postcolonial and Pacific studies (e.g. Hau'ofa 1993; Keown 2004) as well as by 'insider' perspectives that seek to deconstruct them by 'writing back,' such as the works by Albert Tiaopepe Wendt or Sia Figiel. Her novel *Where We Once Belonged* (1996) explicitly takes up Mead's construction of young women in Samoa as sexually promiscuous, as well as Western critiques of the anthropologist's conclusions, in particular the ensuing nature/nurture debate embodied by the 'Mead–Freeman controversy.' Here, the young female Samoan protagonists perceive the findings of the "palagi" anthropologists as stunningly disconnected from the girls' lives and their actual, individual and differentiated experience of sexuality: "What else are they telling you at Samoa High School? That a man can fly to the moon and have sex with moon people?" (210). *Euphoria* does not satisfy a reading through such a postcolonial lens searching for a reversal of perspective or a sidelining of scientific controversies in the manner of Figiel's novel.

What, then, constitutes the value of engaging with this and similar contemporary scientific expedition narratives, given their perspective as outsiders? A reading of such novels is significant, as scientific expeditions

are an ongoing practice of knowledge production. *Euphoria* and other science novels focusing on expeditionary encounters engage with studies of the long and continuing history of Western practice of excavating, extracting, and appropriating local resources and knowledge in the name of science. Even if they do not themselves provincialize Western perspectives, they help to make visible the cost of one-sided knowledge production. Sara Ahmed criticizes the use of such techniques of knowledge as part of a practice of learning *about* and learning *from* the 'Other' in the context of ethnography as "creat[ing] the stranger in the familial in order then to destroy it" (2000, 58). At the same time, these novels are part of a long history of representing and marketing of such stories—be it through fictional or non-fictional travel accounts—effectively establishing, spreading, but also critiquing the formation of the scientific explorer myth, famously debunked by Mary Louise Pratt (1992). The performance of and the struggle with their own epistemological and economic complicities contribute to the discussion of discipline-specific blind spots and culturally specific narratives, exposing the need for a pluralization of perspectives. With its own narrative turn in the 1990s, anthropology continues to embrace the dialogue with literary writing (cf. Starn 2015). In her reading of *Euphoria*, anthropologist Diane Losche reminds us that novels can offer a specific way of knowing:

The interesting point for anthropologists is that the novel form presents a challenge to ethnography, a form of writing that is based on the notion of the objective rendering of culture. To do this there is a radical separation of subject and environment and the anthropologist is sidelined, but if we take these novels seriously, this isn't really possible. Novels, to a greater degree than ethnographies, allow a rendition of the intermingling of subject and environment. (2019, 185)

In this respect, *Euphoria* speaks to scholars who favour polyvalence and show that knowing through ethnography is not the only way of knowing (e.g. Teaiwa 2010).

Drawing on this scholarly and literary discussion concerning both fictional and non-fictional expeditionary narratives, I argue that *Euphoria* sets out to be a narrative of cultural limits but, read with a focus on its performance of the expeditionary narrative's gaze, it may, in effect, sensitize its readers to the cultural limits of narrative. The novel reflects on and exposes the colonial gesture of its 'knowing' scientist protagonists and the 'undoing' of the allegedly 'unknowing' anthropological object but, nevertheless, sits uncomfortably in a tradition of Western scientific expedition narratives

focusing the attention on the ‘doing’ of the subjects of scientific knowledge production. While the text condemns the extractive and destructive nature of scientific expeditions, it also follows this pattern with a male, explorer-type narrator who tells the story of the expedition in hindsight. Couching his recollections within an expedition narrative, he re-semantizes all participating characters, locations, events, and findings as part of the expedition. His narrative shows a prototypical circular trajectory of expeditionary work (Auguscik 2019, 53): from an institutional and financial context in the metropole to transit and supplementation to establishing a main base to exploring, researching, and extracting, and, finally, to bringing the results back to the metropolitan setting. The novel distances itself from his and other ethnographers’ gaze, even begins with and ends on moments of a potential reversal of perspectives, but eventually struggles with the circular trajectory of an expedition narrative positioned in the Western literary marketplace. Through comparisons and juxtapositions, the text gently nudges its readers to see through its characters’ complicity by performing, rather than overcoming, the problem that agency continues to rest exclusively with the Western protagonists. In the subsequent analysis, I will approach *Euphoria* in three steps: first, I will pay attention to its multilayered allegorical dialogue with the discipline of anthropology and specifically ethnography,² inspired by Diane Losche’s reading of King’s novel. Second, drawing on Sara Ahmed’s work on ethnographic writing and Mary Louise Pratt’s critique of the natural explorer, I will analyse the novel’s character constellation in view of the formation of anthropological ‘subjects’ and their construction of indigenous people as ethnographic ‘objects.’ Finally, I will examine how the narrative voice affects the novel’s approach to representing anthropological encounters and moments in which observation is potentially reversed.

***Euphoria* as a Historical Science Novel: Allegorizing the History of Anthropology**

Inspired by the triangular love relationship between the historical anthropologists Margaret Mead, Reo Fortune, and Gregory Bateson and their collaborative research of the people on the Sepik River in New Guinea in the early 1930s, *Euphoria* focuses on the legacy and entanglements of their personal and professional relationships. While this biographical

2 Following Sara Ahmed, the focus of this paper will be on ethnography-based anthropology (2000, 57–58).

interest and theme of romance has attracted much attention in reviews,³ the novel has yet to garner interest in academic literary and cultural analysis. Meanwhile, it has been taken up by anthropologists who recognize descriptions of practices and methodologies, institutional and discursive contexts known and experienced by them, and thus the specific ways in which this text is in dialogue with their discipline.⁴ In his conference paper "On Ethnographic Cruelty," João de Pina-Cabral briefly praises the novel for its authentic "representation of the fieldwork situation of Margaret Mead, Gregory Bateson, and Reo Fortune" (2015, 6). In more depth, Diane Losche, herself a student of Mead's, reads *Euphoria* alongside other fictional accounts of anthropologists in the Pacific in search for representations of hauntedness. She argues persuasively that, in King's novel, it is the anthropologists rather than the village inhabitants who are "haunted in the sense of unfinished business" (Losche 2019, 187). Overall, she is especially interested in the dialogue between novels and her discipline.

In this section, I argue with Losche that, in addition to its biographical interest, *Euphoria* examines the conditions and the effects of anthropological research in the Pacific more generally and offers itself for an allegorical reading. In her comparison of contemporary anthropological fiction, Losche shows some initial reservations regarding the authenticity of the novel's representation of the Pacific islands, yet she recognizes its observations about anthropological practice: "it speaks to things that concern anthropology, the problem of how to describe a society while being aware of the difficulties of interpretation, of 'seeing' clearly" (Losche 2019, 180). The novel, indeed, proves to be in dialogue with an ethnography-based anthropology. It places the ethnographic method centre stage and ties anthropologists as "complex scientist characters" (Kirchhofer and Roxburgh 2016, 167) to the problems they try to solve in the field, thereby showing that anthropologists are not 'outside' the field but must be taken into the equation. King's fictional anthropologists—Elinor or Nell Stone; her husband Schuyler Fenwick, known as Fen; and their colleague and soon-to-be love interest Andrew Bankson—are complex characters with quite different trajectories than their real-life counterparts. In contrast to Margaret Mead, who would divorce Fortune to marry Bateson in 1936, with all three

3 See, for example, the title of Wendy Smith's review in the *Los Angeles Times*: "Anthropologists Find Love in Lily King's novel *Euphoria*"; or Camilla Gibb's review in *The Guardian*: "*Euphoria* by Lily King—The Colourful Love of Margaret Mead."

4 On "recognition" in scientists' readings of contemporary science novels, see Kirchhofer and Auguscik (2017).

enjoying long careers (as well as changing partners) well into the 1970s, the novel ends with Nell's death as a result of spousal violence and Fen's subsequent disappearance from the public eye, leaving only Bankson to tell the story of their encounter and its personal and professional consequences. I propose that the novel's use of artistic freedom to alter critical outcomes of the expedition, along with its representation of the anthropologists' constellation and narrative choices, lays the groundwork for discussing varied and historically evolving approaches to ethnographic encounters.

Euphoria employs various textual levels to represent different historical phases or shifts in the evolution of the discipline: (1) its early development in the 1920s and 30s; (2) a reflexive turn in the 1970s and 80s; and (3) a contemporary postmodern, postcolonial, and feminist theory-based anthropology. These phases correspond to three textual structures in the novel: (1) at the character level, the three anthropologists and their expedition in 1931 stand in for a strong ethnographic interest in Pacific populations in the first half of the twentieth century; (2) at the narrative level, the narrating voice retrospectively reflects on the expedition and its aftermath in the 1970s; and (3) as a text published in the early twenty-first century, the novel encourages its readers to critically engage with its historical settings while maintaining a distanced contemporary perspective on its characters and narrating voice.

First, on the level of character, the text enforces a connection between the characters' scientific approaches and their specific subjectivities. With the influence of Franz Boas and Bronislaw Malinowski at the threshold of the twentieth century, anthropology undergoes a paradigm shift from a biological to a sociocultural field. This shift was popularized in Margaret Mead's ethnographic writings about Pacific cultures in the first half of the twentieth century and is experienced by King's characters. The young characters in their late twenties stand in for the state of a developing discipline, "a nascent, barely twenty-year-old social science" (King 2014, 33). Their romantic triangle represents a small community of white anthropologists: a disciplinary triangle of the academic metropolises of New York, Cambridge, and Sydney, as well as a juxtaposition of the British (social) and the American (cultural) schools of anthropology. All three characters come from different schools with specific approaches to the notion of culture, but they also share particular predispositions to exerting the then still novel ethnographic method of documenting another culture from within through the method of participant observation. At the core of their encounter with one another, as well as with the ethnographic 'Other,' are their debates regarding the possibility of gaining access to other cultures and the effects of observation. In their dialogues and in their

written accounts, they explicitly reflect on their position as observers, on how their subjective observation changes both the conditions that they observe and the results they draw from their research. However, as Losche also remarks, the choices they make as well as decisive blind spots—even failures of observation—prove destructive for them, their relationships, and especially for those who are observed.

Second, on the level of its narrative structure, the novel is in dialogue with anthropology's reflexive or postmodern turn from Talal Asad's *Anthropology and the Colonial Encounter* (1973) to James Clifford's *Writing Culture* (1986). English anthropologist Andrew Bankson's homodiegetic account is conscious of the impossibility of objective interpretation, of anthropology's construction of its objects of analysis, of how much ethnographic writing reads like a description of the anthropologists' own problems and desires. Again, however, he is partisan in choosing which memories to include and which to name in passing. Inspired by questions posed by his 'biographer' and looking back retrospectively in the 1970s at the crucial moments of his career, Bankson remembers the expedition in New Guinea in the early 1930s, when he joined the anthropologist couple Nell and Fen in their field work researching the Tam. Both on the professional and the personal level, their encounter seems to promise the eponymous euphoria. However, his retrospective narrative reveals that this collaboration and, specifically, his own involvement has also had devastating effects: his romantic involvement with the couple has contributed to, rather than preventing, Fen's colonialist theft of a sacred object, as well as the deadly consequences for his native informant and his wife. More so, Bankson's anthropological knowledge has led to the deaths of 300 unnamed indigenous people of the Olimbi village when he shares his knowledge of their whereabouts with a military operation. Even the scientific results of the collaboration between Nell, Fen, and Bankson, a universalist conceptual framework for explaining human and cultural differences, or a map of cultures they call the Grid, we learn, will subsequently come to be misused in order to legitimize fascist and racist theories, exactly at cross-purposes to the young scientists' hope of finally understanding or decoding cultural differences, ultimately exposing the effects of 'epistemic violence.' The novel shows that it is not through ignorance but through the formation of knowledge, specifically ethnographic knowledge, that the harm is done, reflecting Edward Said's argument that the "strength of Orientalist discourse" is not in consequence of a lack of knowledge but in result of "a system of knowledge" (2003, 6).

Clearly, the novel self-reflexively rereads historical anthropologists and negotiates these two shifts in the life of their discipline: on the level

of character, with Nell's (a.k.a. Mead's) fieldwork, in the first half; and on the level of narration, with Bankson's reflections from the second half of the twentieth century. In addition, as with all historical fiction, one may ask about the relationship between its moment of publication and its historical setting: how does it speak to contemporary anthropologists and their problems within the novel's own twenty-first-century context, one in which anthropology continues to question its complicity with the imperial project using the methodologies of feminist and postcolonial studies (cf. e.g. Visweswaran 2015)? What can a reading of *Euphoria* as a "historical science novel"—with a specific relationship between its present and its reconstruction of a past (Schaffeld 2016, 170)—offer to anthropologists now? Or, for that matter, what can it offer to literary and cultural critics who grapple with questions of colonial complicity of their own discipline, which has been strongly infused by the thinking of anthropologists in what is known as the 'cultural turn'? In view of its narrative structure, one might argue that *Euphoria* does not deliberately denounce the complicity stemming from its narrator's choices of remembering and romanticizing, nor does it sufficiently pluralize its perspective to extend beyond the Western anthropological subjects. As a result, one might ask to what extent this text is closer to the modernist perspective of its fictional setting rather than performing a postcolonial reversal more suitable to the moment of its publication (see Doyle 2010).

Building on Losche's interpretation of the anthropologist characters as short-sighted and overly focused on observing 'the Other,' so much so that "they fail to see themselves" (2019, 187), I would argue that, paradoxically, they are actually overly preoccupied with themselves and each other. In fact, Bankson's story is circling around his immediate community of anthropologists (as well as the community of anthropologists at large) almost to the point of parody. The effect of a narrative which is largely taken up by Bankson's account is that the text, too, remains mostly interested in the anthropologist characters. And yet, the choice of a homodiegetic narrator does not preclude a critique which includes that very source of speech and knowledge. While the novel is symptomatic from a postcolonial perspective, reflecting the persistence of a focus on Euro-American concerns and dilemmas and employing the ethnographic encounter to address these issues, it also exposes, as I will demonstrate below, the limitations of its ethnographer characters and narrator. Drawing on Sara Ahmed's analysis of ethnographic texts and Mary Louise Pratt's description of natural explorers in the 'contact zone,' I will show that *Euphoria* lays bare its characters' use of various techniques of knowing ethnographic 'objects' with the goal of constructing themselves as anthropological 'subjects'.

Observation and Self-Observation in the Formation of Anthropological Subjects

Taking *Euphoria* seriously as a science novel and a scientific expedition narrative, this section will bring into focus in what ways the novel participates in the production of scientific knowledge. Specifically, through the lens of Sara Ahmed's critique of ethnography as a technique of knowing and Mary Louise Pratt's unravelling of the myth of natural explorers and their subjectivity in accounts of anthropological encounters, I will show that the representation of anthropologist characters in the novel displays the features of anthropological practice and discourse. Ahmed's critique will be beneficial to discussing the implications and problems that arise from the ethnographer characters' use of various techniques of knowing—for example, when friendship masks method in specifically female accounts—for their formation as anthropologists. In her study of "strangerness," informed by a postcolonial feminist perspective, *Strange Encounters: Embodied Others in Post-Coloniality*, Ahmed defines the stranger as "not *any-body* that we have failed to recognise, but *some-body* that we have already recognised as a stranger" (2000, 55). Instead of thinking of the stranger as an actual embodied person, or of universalizing strangers, she urges us to rethink "how identity is established through strange encounters" (6). Understanding anthropology as a study of strangers, she proposes a discursive analysis of the discipline and, specifically, of ethnographic knowledge as cultural translation: "the translation of a strange culture into the language of ethnography, the language of the one who knows" (58). For Ahmed, the ethnographic encounter is a complex practice marked by "exploratory and accumulative discourse" (59). As participant observers, ethnographers turn strangerness into knowledge and become "professional strangers," differentiating between knowing subjects and unknowing objects (60). Hence, ethnography comes into being as "*the transformation of the stranger from an ontological lack to an epistemic privilege*" (60; emphasis in original). In her reading of ethnographic texts, Ahmed references Pratt's study of "the personal account of fieldwork experience [as] 'a recognisable anthropological subgenre'" (68). In Pratt's argument, the natural explorer and (mostly) his initially seeming "anti-conquest" stance ultimately has a no less complicit function in the colonial project than the conquest-oriented imperialist subjects. Her description of the reflected but ultimately implicated voice behind the ethnographic account will help me to read the specific constellation of the two male characters (1992, 7).

By the time Nell, Fen, and Bankson meet at a Christmas celebration at the Australian Government Station in Angoram, New Guinea, in 1932,

they each have had their share of entangled personal and professional experiences. They have achieved various degrees of initial ethnographic success in the form of publications, or in Ahmed's words, in translating strange cultures, and are variously equipped with institutional backing and finances to engage in this expedition. But they are also broken individuals with broken marriages, broken family life, and, tellingly, broken specs. King's protagonists share an experience of difference that constitutes a characteristic prerequisite for their career paths. While they come from diverse sociocultural backgrounds, they have in common a white Anglophone Western upbringing; they are all traumatized by early losses of loved ones; and they fail to live up to the expectations of their surroundings. As outsiders in their cultures of origin, they learn to observe the societal norms that constrain them. As a result, they develop a longing for a radical departure from the restrictions of civilization. This position as observant participants in their own cultures paired with the desire to seek out other, better-suited cultural models in order to learn about and from them is fundamental to their work as participant observers and, as I propose, to their formation as anthropologists. Crucially, what they hope to find is something that they can bring back to change their discipline, their culture, and their place therein: an object, a theory, a narrative of social structures that would liberate them. In this, the novel follows the circular trajectory of a scientific expedition narrative, or as Ahmed notes in relation to ethnographic knowledge, "the writing of strangeness must *return home*" (2000, 59; emphasis in original). While the anthropologists claim "to document these oddball cultures in the nick of time, just before Western mining and agriculture annihilates them" (King 2024, 95), the novel puts the inequalities of power-knowledge on a scale alongside cultural appropriation, theft, and extraction to the point of destruction. Hence, the first rule of the ethnographic method, "observe observe observe" (55), is echoed in the similarly repetitive practice: "typing typing typing" (156).

The possessive relationship between the ethnographers and their 'objects' pervades the anthropologist characters' conversations and their exchange on techniques of knowing. When Bankson tells her of a Tam woman who will not be interviewed by him after a traumatic experience with white people, Nell reminds him of his place and the possibility of solving the situation with a "formal amends ritual" instead of more "salt and matches" (King 2014, 44–45). Clearly, Nell is shown to be more knowledgeable and more creative than Bankson in setting up her interviews. Indeed, much of Nell's well-meaning but ultimately possessive position in the field can be read through Ahmed's critique of feminist ethnography. Similar to numerous ethnographers in the twentieth century, Nell

repeatedly employs the possessive pronoun in the recurring phrase "her tribes" (2) to describe the communities she studies. Even when the sentiments of the Tam turn against the anthropologist intruders and Bankson urges her to leave the island, she insists that she cannot simply abandon them because "[t]hese are my people" (225). While Nell, too, uses occasional bribes such as sweets or crayons, her main technique in the field is that of gaining "trust and friendship" (Ahmed 2000, 65), as she notes in her diary: "I think I have made a friend. A woman named Malun" (King 2014, 76). Problematically, as Ahmed explains, "the discussion of friendship conceals the ethnographic relation, which is based on the (re)production of strangeness" (2000, 66): "One gets closer to the host culture, one makes friends with strangers, in order to transform that friendship into an expert technique" (67). As Malun becomes a "mothering friend" (King 2014, 127) and Nell steps into the position of not only learning about but also learning from her, there is, with Ahmed, an "apparent reversal of power relation between the professional stranger and the 'group of stranger women'" (Ahmed 2000, 70). Yet, in both her exigent but possessive tone and in her emotional but strategic relationships, the subject of the point of reference remains the ethnographer.

This double role of observer and student who is "learning to be them" culminates in another "technique of knowledge," critically described by Ahmed as "hybridisation," "a way of almost becoming the stranger in order to approximate the being of strangers through knowledge" (Ahmed 2000, 71). Rather than studying the people along the Sepik River, Nell's husband Fen is repeatedly described as aiming at becoming one of them: "His interest lay in experiencing, in doing. Thinking was derivative. Dull." (King 2014, 107) Fen desires to possess and use a sacred, phallus-like object known as "the flute" (39) for the purpose of professional aggrandizement and to upstage his wife whom he envies for her institutional and financial support. In order to reach his goals, he is prepared to simulate same-sex desire in a pretence of teaming up with Bankson and to symbolically and literally throw his informant's and his wife's bodies overboard. Presumptuously, Fen claims that not only is he the rightful owner of the object but that he was able to steal it unbeknownst to anyone due to an "invisibility charm" (182) that he had, ironically, learned from a previously studied Pacific community, the Dobu. The trust gained and used is proof of the characteristic co-optation and re-semanticization of spaces, materials, and subject positions in terms of their part in and relevance for the expedition. In this respect, Fen's technique of 'going native' does not seem to oppose but, rather, expose the ethnographic techniques used by Nell and Bankson.

The third anthropologist's personal characteristics similarly merge with his professional life and his use of techniques of knowledge. Andrew Bankson's tendency to self-doubt translates into a heightened reflection of his practice, which earns him praise for his monograph from his teacher, who "claimed I was the first person to ever admit to having limitations as an anthropologist [...], to being tricked and duped and mocked" (King 2014, 34). Ahmed might recognize this form of explicit failure as having its own tradition in ethnographic discourse as "the knowledge of that which the ethnographer fails to know," resulting in the paradoxically productive opening up about the limits of knowledge: "Such an ethnography of failure still belongs to the ethnographer" (2000, 72). Bankson is least comfortable with the ethnographic method but reverts to no less dubious "traditions of the old sciences" (King 2014, 84): "English structuralism & head measuring & ant colony analogies" (91). At the same time, this passivity also makes him "an excellent theorist" (142) and willing to learn from Nell: "May I observe you with them?" (188). Eventually, this learning from Nell, as much as his learning from the Olimbi men, proves destructive to the very objects of acquired knowledge—expanding the category of objects of knowledge to Bankson's female anthropologist colleague.

Like Nell, then, the two male characters share the combination of personal and professional entanglements. In comparison to Nell, however, the consequences of the male characters' personal and professional decisions are shown to, at once, be more detrimental but also come with fewer repercussions. At first, the two men are characterized as opposites—the sensitive, liberal, non-intrusive, even effeminate Bankson and the insensitive, violent, hypermasculine Fen. Eventually, however, in a move reminiscent of Pratt's critique of the naturalist explorer as the protagonist of "anti-conquest," a type of narrative characterized by "strategies of innocence [...] constituted in relation to older imperial rhetorics of conquest" (Pratt 1992, 7), they are revealed as equally problematic. While Fen is clearly responsible for theft and murder, Bankson's guilt rests on his betrayal of an entire tribe in a moment of "scientific prostitution" (King 2014, 37) and the "misappropriation of [their] theory by the Nazis," which he tries to stop but which inevitably "only enhanced its popularity" and on which he has built his career (256). As this would destroy the suspense related to Fen's crime plot, we do not ever get his perspective apart from a short note which he leaves for Bankson, disclosing not only his knowledge of the other man's feelings for his wife but also implicating him in the larger scheme of theft. And yet, it is Fen who exposes his rival's hypocrisies, reminding his interlocutors and the reader that the Englishman does not like to link the study of anthropology with more obvious exploitative activities such as mining:

"Bankson doesn't like it when the colonists talk about where money comes from" (232). Through juxtapositions of direct and indirect characterization as well as through the reinforcement by analogy and contrast between Fen and Bankson, the novel makes such connections visible.

The mutual observation of the three anthropologist characters and their preoccupation with one another peaks with the arrival of a book manuscript by yet another colleague which thickens the plotlines of romance, crime, and scientific "breakthrough" (King 2014, 233). When the three anthropologists read and discuss the theoretical propositions in *The Arc of Cultures* by Nell's former lover, Helen Benjamin (a fictionalized Ruth Benedict), offering new perspectives on their own culture and personality and challenging many of the discipline's presumptions and representatives, the reader becomes an observer of the anthropologists at work. Indeed, the novel's title refers to this euphoria of conceptual discovery, and climaxes when the protagonists react to Helen's ideas. Nell defines euphoria as "that moment about two months in, when you think you've finally got a handle on the place" and it "feels entirely yours" (50). Yet the novel suggests that it is through the connection with other anthropologists, as well as through the exchange of theories with yet another anthropologist's writing, that they experience a euphoric scientific breakthrough. In the moment of heat—the text discursively connects the "fireworks" of sex and ideas in this fertile scientific threesome (177)—they develop a theory that attempts no less than the mapping of all personalities, tribes, and cultures, which promises to change their careers and their discipline: "We believed we were in the throes of a big theory. We could see our grid in chalk on university blackboards. It felt like decoding. It felt like liberation." (191) To sum up, what emerges from this analysis of the novel's character constellation through the lens of Ahmed and Pratt is that the central trajectory of a coming-to-knowledge is enabled by the reflection about, rather than use of, the ethnographic method. Moreover, this knowledge production is reserved exclusively for the ethnographers.

Anthropological Encounters and Reversals of Observation

In the previous section, I have shown that the formation of the anthropological subjects in *Euphoria* goes hand in hand with both the construction but also the destruction of their 'objects.' In the following, I want to develop this idea further. The novel does not just reproduce but lays bare its protagonists' myopic gaze and concealments of power relations and thus opens

up a possible space for engaging other perspectives of knowledge. With the appearance of the third anthropologist, Andrew Bankson, the community of two—Nell and Fen’s marriage and research team—is changed thoroughly, as is the novel’s narratological makeup. At the end of its first chapter, the text abruptly moves from an extradiegetic, heterodiegetic narrator with Nell as character focalizer to Bankson’s homodiegetic account. At first sight, Bankson’s retrospective reflections seem motivated by his “biographer,” who repeatedly asks him about the provenance of the Grid. More generally, this interest in the personal and scientific outcomes of the expedition mirrors a Western audience outside the novel’s worldbuilding, a readership invested in the novel’s biographical focus on “[t]he love lives and expeditions of controversial anthropologists Margaret Mead, Reo Fortune, and Gregory Bateson” (*Publishers Weekly* 2014). Yet *Euphoria* is more than the writing of one subject of ethnography. The text we read competes with other possible narratives: Bankson’s tale is neither a direct response to his biographer, nor can it be reduced to the scientific results surrounding the Grid and their publication in the scientific journal *Oceania*. Apart from his narration, the changing perspectives—Nell’s diary, Helen’s letter and manuscript, letters between the three anthropologists, letters from Bankson to his mother, Fen’s note to Bankson—are textual proof of their mutual observations and amount to more than the interview itself could offer. This pluralization of discursive spaces is an important feature of science novels but they, too, have cultural limits.

In the remaining part of my paper, I will show that the novel both reflects on and criticizes the pitfalls of asymmetrical power relations at the core of the ethnographic process, but—especially with the centrality of Bankson’s narrative—also risks to prioritize readers’ satisfaction with the plot of romance. In this regard, the knowledge extracted from this expedition, as well as the potential knowledge extracted from the expedition narrative, finds a discursive place in Western metropolitan settings and is driven by needs that have their origin in these settings. In extension of various instances in which *Euphoria* uses comparisons and juxtapositions, perhaps the most striking aspect—but also strikingly underemphasized in the novel—is the reaction of the indigenous characters towards the white anthropologists. Drawing again on Ahmed and Pratt, I would like to make this point more prominent in my analysis of the few but significant moments in which a reversal of perspective is hinted at in the novel. Towards the end of her chapter on strange encounters in ethnography, Ahmed comes to ask about possible reversals of the power relations of subjects and objects of knowledge: “what of the possibility of the stranger, who is the object of his knowledge and recognition, coming

to know?" (2000, 73) Indeed, read closely, the indigenous characters in *Euphoria* often prove better observers than the professionals. Bankson's own informant, Teket, sees through Fen's lies: "he scoffed at the idea of a white man thinking he could be invisible" (King 2014, 243). Similarly, the kitchen boy Bani realizes long before Bankson the nature of Fen and Nell's violent marriage when he notes, "he break her" (245). Still, we only ever get glimpses at the indigenous characters' skills of observation and their reaction to the tremendous violence which they witness as well as endure. In this respect, *Euphoria* loses sight of their knowledge and their survival. Its main focus remains with the ethnographers' practices of 'doing and undoing.' In its hinting at the possibility of reversal, however, as well as in its final pages, the novel makes space for an encounter between the anthropologist characters and the indigenous characters in the sense of Pratt's analysis of the "contact zone" (1992, 4), where both sides potentially gain agency by incorporating the other as part of their narrative. Ultimately, the novel does not reverse but performs and discloses the ways in which the observed characters are 'allowed' such space for the sake of proving the existence of a culturally different perspective. Thus, the observed characters become the medium for the working through of issues on the part of the observers.

Importantly, the few mentions of an indigenous reaction in *Euphoria*—by way of actions, communications, and cultural absorption, or what Pratt describes as the phenomenon of "transculturation" (1992, 6)—suggest the impossibility of understanding these 'strangers,' of knowing what they know. The many encounters between anthropologist and indigenous characters described are framed by two moments which end in hostility and which the Western characters repeatedly fail to understand as originating in reaction to their commingled colonial interest. In the beginning, Nell focalizes a hostile farewell from the Mumbanyo who throw bobbing objects, possibly heads, after them. This initial flight is mirrored at the end of their stay with the Tam, when all three anthropologist characters have to leave hastily after Fen steals the phallus-shaped artefact and gets his informant killed. Later, when Bankson returns to the Tam once more to hand over farewell gifts from Nell, the novel explicitly unpacks the ignorance of another Western character when he utterly misreads the reactions of the Tam, unaware of their previous experience with white people: "not the most hospitable tribe, are they?" (King 2014, 246). His obliviousness reflects Bankson's initial failure to identify with other white people and their crimes. More so, the repetition of what at first may seem like a lack of hospitality exposes the ethnographic encounter as the reason for an—after all—justified violent reaction.

Where such encounters do not end in hostility in *Euphoria*, they end in laughter. The novel's ambivalent oscillation between its critique and its prioritizing of the Western characters, their tragedies and expeditionary trajectories, is especially reflected in the characters' discussion about the differences between but also their preferences for certain kinds of stories and art over others. When Bankson first takes the married couple up the river to look for "a tribe" that would "appeal" to both their interests of study (King 2014, 62), Nell is adamant that they must not have "[w]eak art" (63). Later, when Bankson visits his colleagues, falls sick from malaria and is nurtured back to health by them, they discuss "Western stories compared to the stories told here" (139). Nell remembers that, fed up with "their pigman creation myths and their enormous-penis myths" (139), she once retold the story of Romeo and Juliet in the Solomons. Much to her surprise, the indigenous audience reacted with laughter at Juliet's death: "They [...] thought it was the funniest joke ever told." (140) Nell and Bankson marvel at the failure of the audience to understand irony as tragic: "Tragedy," Nell explains, "is based on this sense that there's been a terrible mistake" (140).

This meta-literary comment prompts the question of the kind of story the novel itself prioritizes. When Bankson attempts to commit suicide before he first meets Nell and Fen, he is rescued by two Pabei men. They pull him out of the water, advise him not to go swimming with stones in his pockets, and leave him behind, with "loud belly-shaking guffaws of laughter" (King 2014, 17). What or who is their laughter directed at? Is this a sign of not understanding the tragic circumstances? Does the novel read Bankson as a tragic or comic character here? The anthropologist, once more, is infantilized, "an oversized child," for whom these "[g]rown-ups [...] didn't have patience" (17). Here, the novel seems to be unsure of to what extent it is his failed attempt that can be understood as tragic, or if the tragedy, in fact, is based on the mistake of these two men to have rescued Bankson and thus enabled the tragedy to unfold. In Bankson's narrative, this possibility is one that the anthropologist overlooks, slipping into complicity and out of responsibility, ready only to account for a curated list of mistakes. Surely, Bankson's account of his failure to rescue Nell or prevent the massive destruction of the Olimbi village is orchestrated as tragic. But whose tragedy is this? Nell's, the Olimbi men's, his own? While Bankson does not hold back on the depth of his remorse, there is a crucial difference between how much space and how much shame he is prepared to spend on his involvement with Nell and Fen and the guilt of causing havoc to the people constructed as objects of anthropological observation. This textual ambivalence can be read as the novel's contribution, if not to a reversal between subjects and objects of observation, then to the Western

protagonists'—and perhaps also the text and its implicit reader's—investment in a particular kind of tragedy.

A key moment in the novel, at once rejecting the Western perspective yet still problematic within the tradition of Western scientific expedition narratives, revolves around Nell's "ethnographic dream" (Pratt 1986, 31; Ahmed 2000, 68). During her initial attempt to understand the all-female *minyana* ceremony, Nell is denied access to the women's quarters, becoming the object of ridicule. This incident is narrated from her perspective as an outsider: "It was silent as she climbed down, but when she was five steps away the house exploded with laughter." (King 2014, 110) When she eventually gains access, her previous lack of success is framed as part of an "ethnography of failure" (Ahmed 2000, 72), further compounded by Bankson's narrative. In Bankson's account, Nell's participation in the ritual is recast as preparation for their first sexual encounter. Nell's access to the ceremony is tinted by her professional curiosity, while Bankson's romantic and sexual investment adds another layer of re-semanticization. This passage highlights the problematic exoticization and sexualization of the women's ritual for the gratification of a white, heterosexual couple.

This movement of hinting at the potential of a more even-levelled 'contact zone' but then diverting attention from the 'Other' to the 'self' is repeated in the final paragraphs of the novel and my final close reading. Towards the end of his career and decades after Nell's death and Fen's disappearance, the now much older anthropologist narrator finally overcomes his qualms about ever visiting the US and follows an invitation to an event which marks the anniversary of their breakthrough. During his visit to the American Museum of Natural History, Bankson comes to a sudden halt when confronted with the exhibit of a death mask. He stops to admire the art of the Tam: "In the socket of each eye was a small oval cowrie shell, underside up, the long slit with its toothed edges making an excellent likeness to a shut eye with lashes" (King 2014, 257). The encounter suggests the potential of embracing the chance to look into these eyes even if only reconstructed by shells, gesturing to the negotiations of a potential exchange of gaze offered in canonical modernist representations.⁵ For

5 In Joseph Conrad's *Heart of Darkness*, Marlowe's attention is captured by the gaze of "a wild and gorgeous apparition of a woman" (2006, 60) who becomes the object of his male, colonialist gaze before she insinuatingly responds with a look that is immediately filtered by his assumptions marked by the words "as if": "She looked at us all as if her life had depended upon the unswerving steadiness of her glance" (61). In the final sentences of Herman Melville's *Benito Cereno*, the text negotiates the agency of the eponymous leader of a slave rebellion by lending his character a final, if posthumous, chance at looking back at

Bankson, the situation does not play out in a mutual exchange of gaze, nor in an acknowledgement of the reversal of observation. Noticing a button among the cowries used to ornament the eyes of the death mask, his attention is redirected to his romanticized, even sexualized memories of Nell: “Caught in the holes of the button were tufts of pale blue thread. I forced myself on to the next display. It was only a button. It was only a bit of thread. From a wrinkled dress I had once undone” (King 2014, 256–57). In other words, Bankson looks at the indigenous artefact, but all he sees is Nell. The literal undoing of the button is reminiscent of his complicity in Nell’s death. After all, in a note to Bankson which he was not to receive in time due to her premature death, she decides in favour of the new relationship and reflects on her relationship with Fen using the same words: “Strange how a ship was our doing and now our undoing” (247). It is her tragedy, and by proxy his, not the destruction of the Pacific people that Bankson emphasizes and that the novel makes visible but also reiterates in its final sentences.

The button is crucial to my reading of the complex mutuality in progress here. The mask shows that the Tam have appropriated the button for their own practice. In accordance with a reconstruction of anthropological encounters as a two-way street—Pratt’s reading of cultural absorption as “transculturation” (1992, 6), as well as with Ahmed’s question about possible reversals of “coming to know” (2000, 73)—the novel’s indigenous characters have incorporated this bit of Western leftovers into their cultural practice. By contrast, the presence of the mask in the museum shows the extractive anthropological practice of collecting and exhibiting. Bankson does not recognize the ambivalence and uses it to negotiate the degree of closure in his narrative. In this and other moments of such navel-gazing on the level of character and narration, does the text follow its narrator in prioritizing the idiopathic empathy for Nell over the heteropathic empathy with the Pacific people? Does it reproduce Western imaginings of the Pacific for a contemporary Western readership and even commingle sex and scientific knowledge with the needs of storytelling and the literary marketplace, or does it expose its characters’ and even its readers’ complicity and their interest and investment in its Western characters, its

the gathered onlookers, and by extension, at the Western reader: “Some months after, dragged to the gibbet at the tail of the mule, the black met his voiceless end. The body was burned to ashes; but for many days, the head, that hive of subtlety, fixed on a pole in the Plaza, met, unabashed, the gazes of the whites [...]” (2002, 102).

Western narrator, and his choices of storytelling? And what is the risk of wanting to have it both ways?

It has been the aim of this contribution to show that by doubling the circular trajectory of the expedition, as a scientific expedition narrative situated in the Western literary marketplace, *Euphoria* ultimately cannot but tell the story as a tragedy of its Western protagonists. In spite of the anthropological ambition to account for cultural difference, there are inevitable cultural scripts at work here. Not only does the novel describe the formation of the anthropological subject as complicit in the creation of 'objects' of study and their destruction, but also itself struggles with a position of complicity. In this regard, "the sexual economy of [colonial] desire" (Young 1995, 90) in Bankson's narrative is mirrored in the novel's marketing with blurbs describing it as "the briefest, purest euphoria" (*Publishers Weekly*), as "taut, witty, [...] a love triangle in extremis" (*New York Times*). In my reading of *Euphoria* as a scientific expedition narrative, one which both follows the generic patterns and critiques them, it is this commingled interest which the novel exposes but also performs. I have argued that *Euphoria* highlights what its characters and narrator cannot see, sensitizing its readers to be wary of their navel-gazing. As a bestselling science novel, it contributes to contemporary discussions in anthropology, in particular to questions of doing ethnography in the field as well as to the thin line between living up to the needs of the Western literary marketplace and troubling the interests of its readers. In its struggle, then, the novel may also offer its readers a reminder that neither learning *about* nor *from* will go very far if it is done by concealing the (scientific, colonialist, or sexual) interest of the knowing subject. Recently, and specifically in relation to the challenges faced in a time of anthropogenic climate change, various publications have spelled out how the (Western) metropolises—in fact, how the world—can and needs to learn from indigenous practices (cf. e.g. Wall Kimmerer 2013; Yunkaporta 2019). What this reading of Lily King's *Euphoria* can contribute to such discussions of epistemic encounters is a bearing out of the complex mutuality between the narrative representation of cultural limits and the cultural limits of narrative.

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SCIENCE NARRATIVES AND POSTCOLONIAL POSTHUMANISMS

Kanak Yadav

Writing the ‘Terrestrial’: Shubhangi Swarup’s *Latitudes of Longing* and the Postcolonial Environment

ABSTRACT Human exploitation and development of the planet has jeopardized the existence of other species in the form of climate change, rising temperature, and loss of habitats. These problems not only urge for a reassessment of human claims of the planet but also raise the issue of how one must write the environment into literature to render it the form of power that it has attained in the age of the Anthropocene. This contribution focuses on Indian English writer Shubhangi Swarup’s debut novel *Latitudes of Longing*, which constructs natural environment as an active force and unifies human and non-human entities to reorient the relationship between humans and environment. Her experimental style interconnecting four different stories challenges the anthropocentric leaning of fiction to privilege the agency of the planet. This paper borrows from Bruno Latour’s concept of the ‘terrestrial’ to examine how Swarup’s novel envisions a relationship between the human and non-human forces.

KEYWORDS climate fiction, environmental agency, *Latitudes of Longing*, non-human, Shubhangi Swarup

Indian English writer Shubhangi Swarup’s debut novel *Latitudes of Longing* (2018) weaves four interconnected stories across borders and terrains to write the postcolonial environment. In a novel that stretches from the Andaman Islands to Burma (Myanmar), Nepal, and a fictional village that is claimed by both India and Pakistan, Swarup narrates a tale which not only privileges indigenous knowledge systems of clairvoyants and villagers in their relationship to the environment but also depicts how the planet operates as an active and agential force in writing the history of the many species that have inhabited the earth. Swarup’s novel uses the natural environment as a structural and narrative device and articulates

the agency of the unknowable, unconquerable ways of the environment by writing about the shared pasts and futures between Earth and its diverse inhabitants. Swarup's depiction of the non-human forces of the environment aligns with French philosopher Bruno Latour's conception of the 'terrestrial,' which is a category directed as much to politicize the impact of the Anthropocene as it is to identify associations between diverse beings occupying the planet. This contribution seeks to examine how *Latitudes of Longing* destabilizes human-centric understanding of the planet and moves towards the 'terrestrial,' both linguistically and thematically, by drawing connections between humans and non-human forces, flora and fauna, land and sea, and mountains and islands. In doing so, Swarup's novel offers a unique narrative mode which problematizes how agency is understood and also reimagines the relationship between humans and their environment.

The issue of environmental degradation, human / animal migration, and the planet's sustainability has acquired a sense of immediacy in present times due to the detrimental impact of climate change. The apocalyptic nature of the environmental crisis has also resulted in a crisis of representation in terms of its literary and cultural depiction. The problem of how to write the agency of the Anthropocene—wherein the term refers to our “current geological epoch” and humankind's deterministic role in shaping the planet and its future (Crutzen 2006, 16)—has become a debatable issue today. This is because of the changing reality of climate change and the agential role that the planet plays which is often overlooked in comprehending the relationship shared between humans and the natural environment.

While there is unanimous agreement that the ecological crisis confronting the world is primarily man-made, the agency of the natural world has become a crucial subject of inquiry. In this regard, historian Dipesh Chakrabarty claims that the history of the Anthropocene requires a fundamental shift in the way human agency and “geological agency” (Chakrabarty 2009, 208) are perceived in relation to the planet. He argues in favour of a critical historiography that surpasses disciplinary distinctions like “human and natural histories” (207) in order to truly grasp the wide impact of ecological changes affecting the planet:

The task of placing, historically, the crisis of climate change thus requires us to bring together intellectual formations that are somewhat in tension with each other: the planetary and the global; deep and recorded histories; species thinking and critiques of capital. (Chakrabarty 2009, 213)

Chakrabarty, therefore, proposes thinking of human beings in terms of “species” and identifying the interlinks between economic, global, socio-political and planetary concerns instead of viewing them as exclusive to each other. In a similar light, philosopher Bruno Latour argues that writing the agency of the planet requires a shift in human conception of agency beyond subject–object dualism to how the agency is distributed “as far and in as differentiated a way as possible” (Latour 2014, 15). Both Chakrabarty and Latour urge for reconsidering the way in which agency is understood in essentially human-centric terms. While Chakrabarty argues for the viewing of human beings as “species,” Latour foregrounds the active role which non-human environments and different organisms play in determining the destiny of the planet. It is, therefore, incumbent upon us to recognize the modes through which the planet asserts itself. Both thinkers decentre anthropocentric understanding of the environment, which has not only focalized on the human subject but also failed to take into account the agential role that other species continue to play in the planetary realm.

In the task of writing the natural world’s agency, Shubhangi Swarup’s debut novel follows a unique mode of narration that does not discriminate between the agency of humans and that of the environment. Instead, the novel’s multi-story structure, which is divided into four parts, categorized as “Islands,” “Faultline,” “Valley,” and “Snow Desert,” narrates different stories set in different temporalities that are connected in their common aim of writing the environment as an active force in the literary text. The novel intertwines tectonic movements, human lives, and animal and plant histories to challenge the dominance of anthropocentric perception of the planet while also envisioning an alternative mode of writing fiction that is narrated from a multitemporal, multispecies, geological perspective.

Realism and the Environment

Many literary works have dwelled upon the subject of the environment and the need to coexist with it, preserving and maintaining its equilibrium. In the canon of Indian English writing itself, writers have explored the complicated relationship between humans and the natural world. From Ruskin Bond’s writing, wherein natural environment serves as a poetic inspiration, to Amitav Ghosh questioning the human–animal conflict in how the territory of the Sundarbans is occupied in *The Hungry Tide* (2004), myriad aspects of belonging and contestations with the natural world have been explored in fiction. In this context, Amitav Ghosh’s nonfictional

account *The Great Derangement: Climate Change and the Unthinkable* (2016) interrogates the limits of the realist novel in writing about climate change by arguing how the form functioned by “the banishing of the improbable and the insertion of the everyday” (Ghosh 2016, 23). He questions how the writing of catastrophic situation remained reserved for what he terms “generic outhouses,” like the realms of “gothic,” “fantasy,” and “science fiction” (32). Notwithstanding the generic hierarchy on which Ghosh premises his argument, as the genres of “science fiction” and “fantasy” are not “outhouses,” to be viewed as less “literary” than realist fiction, his critique of the realist novel’s ignorance of the ecological issue is also unconvincing. The variety of literary texts that converge realist elements, scientific knowledge, myths, folklore, and dystopian future to incorporate the agency of the ecosystem counter Ghosh’s one-dimensional critique of realism.

While the emergence of the nineteenth-century realist novel centred around the human subject, its individualism, and the bourgeois household, it would be erroneous to claim that the genre itself has not engaged with the environmental question. For example, contemporary fiction from the northeastern states in India significantly contribute in juxtaposing human lives and the natural world. Easterine Kire’s folkloric novel about Nagaland, *When the River Sleeps* (2014), merges reality with fantastical elements to depict Villie’s unified existence with the forest, which he considers to be his wife (Kire 2014, Chap. 2). Similarly, Mamang Dai’s *The Black Hill* (2014), while recreating the nineteenth-century history of the tribes of Arunachal Pradesh and their encounter with the white colonizer, constructs non-human environment as a potent force whose ways need to be abided with:

He saw the river glinting and turning like a giant snake as far and wide as the eye could see. As he stared at it the river changed shape. Now it was like the trunk of a giant silver tree, spreading its shining arms and limbs across the body of the earth. It had crashed into the earth from the mountains, and now it wanted to hold the earth in a vast embrace. (Dai 2014, Chap. 1)

Such an evocative, poetic description of the river originating and bending like a serpent emphasizes its all-consuming power, which is visualized as a giant living being and symbolizes the supremacy of the environment. Moreover, Dai’s extraordinary, affective use of language guides the reader into recognizing the larger-than-life influence of the physical environment in moulding the lives of humans. The latest text to manifestly connect the environmental question with other socio-political concerns like the global restructuring of the world on account of the mass

displacement of people and the refugee crisis is Amitav Ghosh's novel *Gun Island* (2019). Ghosh engages Bengali folklore about the gun merchant and the snake goddess, Manasa Devi, to explore the topical issue of climate change and its damaging impact on the planet. Ghosh follows from his earlier argument in *The Great Derangement* of incorporating "improbable" events into realist fiction and uses "outlandish coincidences and chance meetings" to establish connections within the novel (Clark 2019). These instances, forming part of diverse Indian English novels, demonstrate the varied techniques through which writers establish how the natural world comes into interaction with humankind. From exploring legends and folklore to lyrical sentences and 'improbable' occurrences emphasizing the omnipotence of the environment, literature writes the environment not merely as a background setting but as a powerful force in itself. Many contemporary works of fiction do not merely portray the beautiful visual of the natural world, or else the activist concern for environmental degradation, but the non-human environment itself as an agent capable of affecting change.

In the trajectory of literature and the environment, Swarup's *Latitudes of Longing* is distinctive and unprecedented, as it does not even render structural and narrative control to human characters. While many works have explored the interstices between man and the environment, such as Indra Sinha's *Animal's People* (2007) and Amitav Ghosh's *The Hungry Tide* (2004), the focalization of Swarup's novel is not through human characters but, rather, geographical. Judith Rahn, in her reading of Swarup's novel, argues that "by focusing on the physical materiality of the land first and the human lives second, the narration sets the scene for an investigation of our world which does not situate the human centre-stage" (2021, 242). Whether it is the narrative mode or the temporal vastness of the novel, the human characters, plants, animals, mountains, sea, and islands all come together to tell the story of the planet and its unknowability. Swarup's construction of the Earth's agency is also not anthropomorphized but experimentally narrated.

As the novel traverses the Andaman Islands, Myanmar, a valley in Kathmandu, and a disputed village in the Karakoram mountainous region, it accords agency to the non-human elements through its linguistic style and thematic structure, which create a planetary sense of time and space, acknowledging Earth's agency as a far greater force than humankind may ever comprehend. For instance, the novel opens with the sentence: "Silence on a tropical island is the relentless sound of water" (Swarup 2018, 3). It describes the sound of predawn as "a larval silence," "a deliberate pause, reflection filled with hope and anxiety. Hidden amongst

the cluck and hiss, the croak and chatter outside the window, are songs of the extinct” (83). Such lyrical sentences with their onomatopoeic effect account for the silent ways in which the non-human entities communicate. These accounts are endowed with significance because they are represented as part of the planet’s mode of communication rather than obliquely signifying human emotions.

Similarly, a sentiment reiterated often in the book is how the formation of the continents and their movements is too vast a phenomenon for human beings to even imagine. When the narrator connects Plato’s struggle for survival in prison with the battle against extinction that threatens different species, it elaborates on the incomprehensible ways in which the planet was formed: “If the evolution of life was guided by survival, the movement of continents was guided by an imagination that no life form would be capable of comprehending” (Swarup 2018, 175). Such an understanding that knowing the planet in absolute terms is impossible guides the novel into applying experimental methods to explore how human lives are entangled with other living beings occupying the planet. Taylor Poulos argues in their review of the book how the “unifying theme of the book is desire and how fault lines separate each character from what they want” (Poulos 2020). In this regard, the title of the book, *Latitudes of Longing*, also ties human desire, conceived in sexual, political, and spatial terms, with the different landforms that segregate the four parts of the book: Islands, Faultline, Valley, and Snow Desert. Hence, it is not only the subject of environmental agency that makes Swarup’s novel stand out but also the structural format of her book that privileges planetary agency by showing interrelations between human life, animal and plant life, and the formation of Earth and its various landforms.

Towards the Terrestrial

Since the language, scope, and thematic structure of *Latitudes of Longing* focuses on interconnectedness, it aligns with what French philosopher Bruno Latour has termed “terrestrial,” which implies that all beings are “earthbound” and linked in the way they occupy the planet (Latour 2018, chap. 18). Swarup’s interest also lies in establishing these links between species such that the novelistic world is not centred around human subjects. On the contrary, humans form part of the geological structure that the novel follows. The entire novel is involved in portraying the entanglements between different species, timelines, and landforms to decentre the human and move towards the ‘terrestrial.’

In his book *Down to Earth* (2018), Latour argues how the contrary pulls of the “local” and the “global” have kept humans from identifying the impact of climate change. This is because the question gets reductively positioned as a choice between traditional living and modern development. In contemporary times, globalization is touted as the way forward, conveniently associated with progress and modernity, while local attachments are perceived as “nostalgia for ‘archaic’” (Latour 2018, Chap. 4). Issues of environmental damage have been camouflaged and dismissed due to the prevalence of such a false binary. Therefore, Latour contends in favour of a third position, namely, ‘the terrestrial,’ which aims to not only overcome the polarization of the former two categories but also enable human interaction with their actions and with non-human beings so as to lead to an effective counter-politics.

Latour identifies the ‘terrestrial’ as a political category that responds to climate change and human impact on the environment. As he puts it,

We are at last clearly in a situation of war, but it is a phony war, at once declared and latent. Some people see it everywhere; others ignore it entirely.

Dramatizing somewhat extravagantly, let us call it a conflict between modern humans who believe they are alone in the Holocene, in flight toward the Global or in exodus toward the Local, and the terrestrials who know they are in the Anthropocene and who seek to cohabit with other terrestrials under the authority of a power that as yet lacks any political institution.

And that war, at once civic and moral, divides each of us from within. (Latour 2018, Chap. 18)

Terrestrial, as implicit from the reference, becomes a category for not just the recognition of environmental change and how to address it but also human dependence on other beings for their own survival. As humans tussle between the two poles, called the ‘local’ and the ‘global,’ they fail to realize that the urgent need is to reorient politics towards environmental concerns. The ‘terrestrial’ as a concept is Latour’s way of bringing together the human with other non-human beings for “*engendering terrestrials*,” wherein the connections between beings are not conceptualized in terms of their utilitarian value but based on their “dependency” on each other (Latour 2018, Chap. 18, emphasis in original).

The politics of Swarup’s novel aligns with the idea of the ‘terrestrial,’ since the novel disregards polarized understanding of the planet in terms of binaries like human vs non-human and human agency vs Earth’s agency. Instead, it foregrounds the planetary, in terms of its structural organization

and narrative voice, which make a deliberate attempt to subvert human centrality in literature. Both structurally and thematically, the scope of *Latitudes of Longing* is 'terrestrial,' since it privileges the planetary over the human self. It interconnects supernatural and earthly elements, human and non-human forces, indigenous and scientific knowledge systems to make planetary claims that transcend manmade borders and divide. In terms of the novel's plot structure, it underlines the planetary by establishing connections between beings across space and time. The novel includes mischievous ghosts from another era meddling with Chanda Devi's household, depicts a peepul tree and a padauk growing in "coital position" (Swarup 2018, 9), a palm tree that flowers once a year and dies soon after, telepathically communicating to Chanda Devi of her own impending death after her daughter's birth (64), and dreams that can foretell, provide comfort, and connect the unknown past and future with the material present. Apart from its thematic structure, the novel is also geographical in terms of its language, which entangles human knowledge and desire in geological metaphors. Chanda Devi, the clairvoyant wife of scientist Girija Prasad, has already visualized "the rivers of blood that will drain out of her body one day" (6). Similarly, the sexual tension between the couple is illustrated through geographical terminology: "Continents apart in their beliefs, god was the precarious isthmus connecting them" (12). In correlating blood flow with river, human beliefs and ideologies with continents and land masses, Swarup's novel invents a non-human-centric mode of writing which also anthropomorphizes the terrestrial.

Right from the start of the novel, Swarup connects seemingly disjointed terrains. In the first part of the novel itself, which sketches the challenging life in the Andaman Islands, Swarup puts forth the idea of the supercontinent Pangaea through the character of Indian scientist Girija Prasad. As Prasad dreams about Pangaea, from which the seven continents are believed to have formed, the narrative acquires a distinct tone which is not of passive description but that of an active moment of creation.

The belly of Latin America slept comfortably in the groove of West Africa. The jigsaw fit so perfectly, Pangaea came alive. What seemed like bits and pieces breaking off and floating in the daytime now felt like a living being. He was ecstatic to see her stretch her arms wide, from Alaska to the Russian Far East, to see her lift her head and stand on her toes, poles apart. Pangaea, blooming with the grace of a ballerina. He was aroused. But when the downpour suddenly ended, it woke him up. Left to ruminate on half a dream, he wondered why the continents had drifted apart in the first place. Water swept into the cracks, a trickle turned into a stream, streams turned into rivers, And then there was no turning back. (Swarup 2018, 11)

Apart from anthropomorphizing the formation of the planet and the oceans and continents that form it, the above reference also feminizes Pangaea by perceiving it in terms of a female body. In conceiving Pangaea in anthropomorphic terms, as part of a dream sequence of the researcher, Girija Prasad, Swarup writes its agency while also connecting the entire world into an *a priori* origin. Ironically, Prasad, an academic, attains answers to his inquiring questions not through a rational study but through the shifting consciousness of a dream. This dream is not only symbolic politically, in terms of denoting an interconnected world that otherwise stands divided by borders—both physical and ideological—but it is also significant for imaginatively consummating the relationship between the human with the unknowable element of the natural world. Girija Prasad's intellectual pursuits, about comprehending and articulating the formation of Planet Earth, attain climax in the visuals of this dream sequence. In sexualizing their relationship, Swarup forges a union between the human subject and the earth (s)he inhabits.

The structural organization of the novel, which is based on geological divisions, also establishes association between otherwise disconnected tales, since the novel connects the journey of different subjects to convey their intertwined lives. To explicate: the first part, "Islands," chronicles the life of the Varma in the Andaman Islands as Girija Prasad engages in scientific research and his wife, Chanda Devi's indigenous, "otherworldly," knowledge subverts his rational approaches. The next section, "Faultline," takes the reader on the journey of their domestic help, Mary in conflict-ridden Burma as she struggles to reconnect with her estranged son, Plato, who is serving time as a political prisoner. This is followed by the third part of the novel, entitled "Valley," which depicts the lonely life of Plato's friend, Thapa, as he lives in Kathmandu, having lost family members to earthquakes. The last section, "Snow Desert," focuses on the life of Tashi Yeshe, a.k.a. Apo, a grandfather figure, who originally belonged to a nomadic tribe from the Changthang region but moved to the unnamed village in the Karakoram region on account of the changes brought about by environmental shifts. His existence in a disputed village subverts man-made borders, since the village oscillates between belonging to India and Pakistan, claimed and reclaimed by each of the nation-states in an endless battle. Such interlinked storytelling, which blurs the distinction between plot and subplot, parallels Swarup's political project of writing the environment from a shared, multi-species perspective. The novel does not distinguish between 'major' and 'minor' events or characters, since a seemingly minor character like Mary, in the first section, gains her own story in the second part of the novel. It also does not separate the human from other,

non-human, beings and their attachments to the planet. Swarup's experimental narrative technique also challenges the structuralist understanding of the text and the centrality of characters, since figures that are introduced tangentially achieve their own story over the course of the book, thereby emerging into significance.

Swarup's experimental, magical realist novel foregrounds connections between human and non-human forces by moving back and forth in time and space and blurring the line between the living and the dead, the real and the supernatural. For instance, the house occupied by Girija Prasad and Chanda Devi is simultaneously occupied by the ghosts of soldiers from the colonial time period, and Chanda Devi has the uncanny ability of communicating with them: "Chanda Devi, the clairvoyant one. She feels for ghosts and enjoys the laconic company of trees" (Swarup 2018, 5). Although such a description might place the novel into the realm of the fantastic, Swarup identifies Devi's gift for premonition as part of an indigenous knowledge system. Chanda Devi's "divine prowess" captivates the locals, as she appears "far more learned" to them than her academic husband, Girija Prasad (30). She gets contacted by the Forest Department when an elephant goes wild and becomes uncontrollable. She predicts a crocodile attack and saves her husband from being devoured by the reptile. The novel argues about environmental problems and the functioning of the planet by privileging the environment itself in the form of Chanda Devi's local knowledge(s) that seek(s) to bridge the gap between human comprehension and the vast unknown.

Interestingly, Swarup rejects the label of 'magical realism' in categorizing her fiction and argues that such a perception merely showcases human withdrawal from the environment. As she states:

If we see stories around nature as being something magical, then it highlights how disconnected we have become from nature, to see it as magical instead of real. The seeming magic in my novel is inspired by natural history and real details that I chanced upon in my research. (Swarup 2019)

Swarup's choice to deploy 'magical realist' narrative techniques and yet distance herself from the categorization seems like a strategic move to resist labels and the reductionism that follows. Although her justification to not relegate questions about the environment in the territory of the magical and the fantastical provides a political angle to her decision, it seems her rejection of the term is not only based on her environmental politics but also an attempt to underline her writerly privilege. In a famous interview, Colombian writer Gabriel García Márquez declared that his use

of “surrealism comes from the reality of Latin America” (Márquez 1973). While critics read Márquez’s works as ‘surrealist’ and ‘magical realist,’ he foregrounded how his literature was rooted in the reality of his continent. Swarup’s rejection of the phrase echoes Márquez’s writerly position, where he distanced himself from the terms within which critics were attempting to contain his literary production. Swarup’s reservations also originate from a deep-seated awareness of the political connotations of reductive labels. While she portrays humans, animals, ghosts, and non-human elements of the environment occupying the same time and space, she resists naming such an experimental technique in favour of affirming the reality of environmental change and the requirement of an effective literary politics that could tell such a story. Her disapproval is not merely a sign of artistic withdrawal from academic engagements but reveals the limitations in the critical vocabulary which disallows agency to non-human forms of being and requires them to be slotted under the umbrella term of ‘magical realism’ in order to rationalize and make sense of them.

Swarup forms attachments between humans and other species in writing the agency of the natural environment, and her method also resonates with theoretical writings over the environmental question. Feminist thinker Donna Haraway has proposed making kin as a method to address the issue of climate. According to her, making kin aims to go beyond “ancestry or genealogy” to form attachments as “earthlings” (Haraway 2015, 161–62). Haraway’s sense of kinship is not conceptualized in terms of human lineage but as an alternative trajectory that forms bonds between species on account of their sense of belonging to the planet Earth. This call for establishing kinship between humans and other species appears allied with Bruno Latour’s conception of a “system of engendering” (Latour 2018, Chap. 18). While Haraway argues for “multispecies assemblages” (Haraway 2015, 160), Latour contends for working upon a “system of engendering” (2018, Chap. 18) that focuses upon the entanglements within which varied species find themselves. Both the thinkers, under different nomenclatures, make a case for moving beyond anthropomorphism and searching for connections between the human subject and other beings.

Latitudes of Longing visualizes attachments between the human and non-human and makes an attempt to narrativize the incomprehensibility of the planet and its formation. While Part 1 featured Chanda Devi communicating with trees, ghosts, and mortals, Part 2 of the book shows interconnected lives between humans and other living beings. For instance, the novel narrativizes student activist Plato’s trapped existence in a cellular jail in Burma by drawing parallels between his predicament and that of other species. When he is imprisoned, he dreams of himself as “a fly caught in

tree sap” only to be awakened to the struggle for life between a cockroach and a mantis, as the latter devours the former (Swarup 2018, 168–69). Such parallels not only point to the power struggle for survival in which every creature, including humans, is involved but also become an ecological response to the political climate in postcolonial Burma. This becomes apparent in a vision from the future when Plato has escaped from the jail and encounters a fossilized gecko caught in a piece of amber, which makes him contemplate over his own personal and political situation:

He confronts his preoccupation with death when he holds a piece of amber in his quivering palm. Embalmed within the resin is a gecko, immune to decomposition. When the Burman had kicked his mother, her womb could have hardened, the amniotic fluid drained out and petrified into a fossil himself, all before he could open his eyes. (Swarup 2018, 170)

The comparison between the human and the lizard signifies multiple aspects of Plato’s being: his death-wish, his desire to reunite with his mother, and his abjection as a revolutionary leader struggling for a peaceful nation-state. This association between the human and the non-human, the living and the dead also connects different temporalities, as the million-years-old gecko continues to thrive in the present age by being fossilized and preserved in amber. The amber serves a metaphor for the connected nature of the past, present, and future; and, in contemplating the gecko’s sense of belonging to the Earth and its formation over the years, the human self also encounters its own sense of creatureliness.

Between the Ecological and the Political

Upamanyu Pablo Mukherjee, in his influential book *Postcolonial Environments*, argues how the concept of the “non-human” has enabled the intellectual to politicize the environment without dissociating it from the sociological. In his words, “they ensure that it is no longer possible to see ‘nature’ or ‘environment’ as something that exists out there, outside the realm of the human or the social” (2010, 147). This sentiment seems to guide Swarup’s novel as well, since she debates crucial changes taking over the environment while also not ignoring their impact on human lives. For instance, Swarup’s imagining of human relationships with the planet and its ecosystem also comments upon nature’s wrath and destruction. Such an understanding is overtly present in the first part of the story, in terms of how uninhabitable the Andaman Islands are, where humans must bend to

the ways of the environment in order to survive. However, the other three stories forming part of the novel juxtapose ecological factors with the lives of environmental and political refugees and show how the ecological issue is associated with the socio-political question. Swarup politicizes the environment by raising the question of natural disasters and the physical and emotional turmoil that they cause in the individual. Yet she also deploys environmental disasters to provide narrative resolution to the characters by connecting human life and death with the geological. In this regard, Gaana Jayagopalan rightly argues that the "connection of disasters of individual lives, vis-à-vis calamities rooted in the geology of the space-times, is central to the novel's negotiation of the past, present, and future" (2021, 171). The novel connects humans and their personal loss, grief, and its memory with the transcendental power of the earth, water, and mountains to underline the inevitability of creation and destruction, life and death.

The conflict between the agency of the human and the non-human is aesthetically resolved in the novel by synthesizing human selves with their environment in the moment of death. In a romanticized, lyrical narration, Swarup provides a closure to the abject characters sketched in the novel when they foresee their impending deaths. When the researcher, Girija Prasad, now an ageing, lonely man, walks into the tsunami aware that he cannot escape it in any manner, he accepts his death and union with the natural world. As he contemplates, "For how often does a man get to peer into a thriving ocean floor minus the ocean, even though it will go undocumented?" (Swarup 2018, 124). Ironically, he deciphers the mysteries of the world in an eventual embrace that annihilates his corporeal self. While such a trajectory seems to connect the human with non-human elements only by means of obliterating the 'human' identity of the former, other strains of the novel anthropomorphize the non-human to reconnect human with the environment.

In the third part of the novel, the narrative twins the flooding river, Bagmati, with the poverty-stricken teenaged girl Bebo, also named Bagmati, to reconcile Thapa with the natural forces that took away his family. In Thapa's depiction of the legend associated with Bagmati, he thinks of it as "a kind river" (Swarup 2018, 228). His fantastic retelling of the river as a goddess who sends her daughter to the Earth parallels his own relationship as a father figure to the teenaged Bagmati, who showed up at his doorstep one random day:

The goddess of rain felt remorse, for the cloud that had burst with sudden excitement, causing the landslide, was one of her devotees. To make amends, she sent down her daughter, a river, from heaven. (Swarup 2018, 227)

The folkloric story Thapa narrates seems modelled on his own life-journey, since he too lost his entire family to an earthquake which destroyed “the whole village” (Swarup 2018, 246). The companionship of the girl, Bagmati, seems to then indicate the workings of higher powers in affirming life instead of death. It is in the continuation of his life that Thapa’s unity with the environment is imagined, since the presence of the girl metaphorically stands for the river. In Thapa’s scenario, Swarup addresses the political issue of the precarious lives of environmental refugees and their abjection by upholding the sustainment of life. Towards the end of the section, the narrator articulates this sentiment in the following words: “Thapa understood that the end of his story did not lie in death, for even death forsakes those who live in despair” (246).

The final story of the novel politicizes concern for the environment by dwelling upon the life of Apo, a “soldier-cook” in the Indian army whose life narrative is a telling reminder of borders and their futility (Swarup 2018, 281). Having witnessed the “Chinese invasion” (260) of the Changthang region, to which he originally belonged, and the endless war between India and Pakistan over the village he migrated to, Apo’s tale critiques the tenuousness of “invisible political borders” (266). Through Apo’s character, Swarup ponders the meaninglessness of man-made boundaries, especially when the non-human environment commands the ultimate supremacy: “‘The mountains are the truth,’ Apo says. ‘They are remnants of truth behind all creation. Precariously balanced, threatening to crumble’” (284). Apo’s aphoristic wisdom questions human intervention on the planet while emphasizing indigenous knowledge systems. In upholding the ecological, Swarup takes a political stand while also not ignoring the overlaps between the socio-political and the environmental.

Conclusion

Latitudes of Longing reimagines the way in which the environment can be narrated in fiction. Its disjointed yet interwoven method of narration becomes a unique way to explore the different terrains forming the planet and their shared present, past, and future. When the character of Apo articulates in the novel, “‘ocean, sea, ice, snow mist [...] they are different states of being’” (2018, 299), it serves as a reminder of Swarup’s political endeavour of showing the entanglement between different landforms, beings, and time periods. From the drifting of the continents to the formation of islands and their similarities with mountains, the novel adopts geological vocabulary not only to connect the human with the non-human

but also as a structural device. Swarup adopts an experimental, non-linear narrative with interconnected storytelling such that the movement of the narrative itself parallels changing topographies. From granting linguistic agency to the natural world, to visualizing attachments between humans and other species not as antithetical but interpenetrative, Swarup's novel recognizes environmental issues and human impact on them. Furthermore, in juxtaposing ecological concerns with socio-political issues, the novel's engagement with the environment is not a product of apolitical, romanticized idealism but is rooted in material realities of human impact on the planet. Swarup politicizes the ecology of postcolonial territories and assigns an agential, 'terrestrial' role to the environment with its desire to establish connections and its linguistic and formal structure, which underline the sovereignty of the planetary. In addition, the novel foregrounds planetary reimagining by offering an aesthetic resolution to the political battles launched by humankind on themselves and other beings. The political prisoner, the scientist, the clairvoyant, and the refugee all forge a unique primordial relationship with the non-human environment, which is not based on an apolitical romanticization of the natural environment but on a deep-seated understanding that humans, along with their environment and other species, form part of a collective that is terrestrial in scope. In doing so, Swarup breaks the dichotomy of the natural environment and the human-centred world to show their interconnectedness across timelines and geographies.

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Scientists and Their Discoveries: A Postcolonial Reading of Ted Chiang's Science Fiction

ABSTRACT “What is the role of human scientists in an age when the frontiers of scientific inquiry have moved beyond the comprehension of humans?” asks Ted Chiang in “The Evolution of Human Science” (239). Chiang’s question highlights the centrality of science and the significant position of scientists not only in a time of crisis, anxiety, and insecurity, but in an age of scientific advance at a pace that already threatens to exceed the human scale and human sense-making capacities. Scientific discovery as the last ‘uncharted frontier’ is historically grounded in the colonial, Eurocentric fantasy of advancement, progress, development, and imperial appropriation. Through a postcolonial lens, we analyze Ted Chiang’s short stories “Exhalation” (2008) and “Story of Your Life” (1998), tracing how Chiang uses the image of a “solipsistic periscope” to detach speculative imagination from colonial frameworks by emphasizing the centrality of subjectivity in scientific inquiry, while also challenging traditional views of discovery as a linear progression.

KEYWORDS postcolonial science fiction, postcolonial theory, science and decolonization, short fiction, Ted Chiang

Introduction: Ted Chiang and Postcolonial Science Fiction

In a curious, genre-bending piece titled “The Evolution of Human Sciences,” Ted Chiang asks a question that is programmatic for his work as a writer of speculative fiction and science fiction: “What is the role of human scientists in an age when the frontiers of scientific inquiry have moved beyond the comprehension of humans?” (2002, 239). The story is framed as an editorial to a science journal of a distant future, where “metahuman”

forms of communication, knowledge production and dissemination have long outpaced standard human capacities. From the space of that distant future, “The Evolution of Human Sciences” addresses the crisis of an ever-widening gap between masses of available data and its processability and gestures to a twenty-first-century crisis of interpretation. Furthermore, it foregrounds issues of power which invariably accompany the production of knowledge. “The Evolution of Human Sciences” thus narrates a constant state of being overpowered and offers a meditation on pace, scale, and power which rings familiar, for example, in Walter D. Mignolo’s thinking about the global, almost pathogenic spread of Euro-Western epistemologies as colonial imposition. The critical question that links Mignolo’s critique and Chiang’s fiction, then, is: “Who, when, why is constructing knowledges?” (Mignolo 2009, 160). Chiang’s speculation about science and the production of knowledge becomes, in this way, an engagement with power.¹ Offering a postcolonial reading of Chiang’s work, we follow Bill Ashcroft’s insistence on the postcolonial as a way of reading and engaging with texts. “Postcolonial,” as Ashcroft maintains, “is not chronological, but it’s also not ontological. That is, there is no particular way of being postcolonial, but postcolonialism is, above all, a way of reading, a way of reading the engagement of colonized people with imperial power” (2019, 00:29:48–00:30:09). Arguably, Chiang’s fiction does not emerge from a direct experience of settler colonization, although there is a case to be made for the fact that he is writing from a place (the United States of America) that is, by definition, bound up with invasion and settler-colonization. We suggest that Ashcroft’s point about postcolonial reading frees up a wide variety of texts and themes for postcolonial critique and critical interrogations of power relations because the postcolonial, understood in this way, is not conceptually restricted to a specific time nor framed as an ontological condition. We thus use the term *postcolonial* to denote an exegetic practice which is, in its ethical investments, linked to *anti-* and *decolonial* efforts but may well be incongruent with the wider political demands of decolonization.

1 Ted Chiang, born and raised in the United States, has gained much critical and scholarly acclaim, as expressed in numerous, highly prestigious literary awards: multiple Hugo Awards (2002, 2008, 2009, 2011) for best short story and best novella, a series of Nebula Awards (1991, 2000, 2003, 2008) in the same categories, two Locus Awards for short fiction, and best collection of short fiction (2003). Chiang holds a degree in computer science, a background which often reflects in his fictional engagements with technology. Notably, his novella *The Lifecycle of Software Objects* (2010) won the Hugo Award for best novella in 2011. His short story “Story of Your Life” was adapted for the screen in Denis Villeneuve’s *Arrival* (2016).

If exploration “lies at the heart of SF” (Seed 2005, 4), postcolonial critique seems in a unique position to explore the deep colonial origins and affiliations of *exploration* and *discovery*—staple literary (and cultural-political) tropes in the Euro-Western speculative tradition. As Jessica Langer has argued, the idea of a “postcolonial science fiction” seems to pose a conundrum because science fiction itself often “is seen as aligned with colonialism and therefore anathema” (2011, 1). This observation rings true (and gains new currency in the so-called Anthropocene) considering H. G. Wells’ iconic time traveler who speculates that, in the future, “one triumph of a united humanity over Nature [must have] followed another” (Wells 2012, 30). Expressing his awe at the unspeakable “realities as I found here” (42) along the uncharted temporal ‘frontier,’ he resorts to the racial categories of difference and an imperial, binary logic that defines the racism of the Victorian age: “conceive the tale of London which a negro [*sic*], fresh from Central Africa, would take back to his tribe!” (42). For Wells’ protagonist, knowledge about the distant future can be made (and epistemic law and order restored) only by the force of “cognitive imperialism” (Simpson 2017, 72) and recourse to the gendered colonial binary of otherness: “think how narrow the gap between a negro [*sic*] and a white man of our times, and how wide the interval between myself and these of the Golden Age!” (Wells 2012, 42).

We suggest that Chiang’s writing is an explicit disavowal of such a Wellsian (and any other) science fiction tradition which hinges on imaginaries of difference and tropes of radical otherness that are often articulated in explicitly racial terms and/or mobilize racialized epistemic infrastructures. Offering a postcolonial reading of “Exhalation” (2019, first published in Strahan 2008) and “Story of Your Life” (2002, first published 1998), we trace how Chiang disengages science fiction scenarios from colonial imaginaries and reconfigures moments of discovery and explorative journeys.

The critical and creative project of postcolonial science fiction, as Jessica Langer has seminally described it, notes “the ways in which Western scientific discourse [...] has interacted with colonialism and the cultural production of colonized peoples” (2011, 9). Therefore, by pointing to the “revolutions in science and technology during the seventeenth, eighteenth and nineteenth centuries” as the “unprecedented” (Blackford 2017, 1) caesura giving rise to Euro-Western science fiction, it is important to explore how science, exploration, and discovery have often been used to support colonial and imperial agendas. If “colonialism is a significant historical context” (Rieder 2008, 2) to science fiction, then postcolonial responses—through theory, criticism, and fiction—are powerful interventions which destabilize

the imperial grammars of Euro-Western imaginaries of exploration and discovery. As again Langer argues, “writers, film-makers and others involved in the production of postcolonial science fiction participate [...] in decolonization” as an ongoing process of reconfiguration: “utilizing the particular strengths and possibilities contained in the science fiction genre to further the project of a world not only politically but (variously) economically, culturally, intellectually and/or creatively decolonized” (2011, 8). A project which also characterizes, as we argue in this chapter, the short fiction of Ted Chiang and its practice of systematic “epistemic disobedience” (Mignolo 2009).

The postcolonial thrust of Chiang’s short fiction manifests, to no small degree, in its critical re-examination of the very notions of discovery and exploration, be this in the form of folding ‘discovery’ back in on itself in “Exhalation”—reversing its direction from the exterior towards the interior of inner space—or in the emphasis on relationality, reciprocity, and transformation evoked in “Story of Your Life” as an alternative imaginary of or “decolonial option” (Mignolo 2009, 161) in envisioning alien visitation. Chiang’s work thus offers gestures of refusal to science fiction as “a First World Vision, a set of stories about the future written by inhabitants of, and for the benefit of readers who were inhabitants of, the industrialized Western world, which dominated the twentieth century” (Clute 2003, 66).

Chiang’s stories share, in their diverse “conjugations of the ‘what if’” (Packard 2019), one of science fiction’s central and perhaps genre-defining characteristics: the construction of “embodied thought experiment[s]” (Seed 2011, 2). However, in critically interrogating the parameters of experimentation and resulting discovery itself, they reject the colonial baggage of Euro-Western genre traditions. So we unpack, in this chapter, the “epistemological expedition” that Christine Lötscher (2017, 69) identifies as a key feature of Chiang’s work generally, yet discuss how Chiang’s “pocket-sized epic[s] of scientific inquiry” (Lohier 2019, n.p.) challenges colonial imaginaries and the “ultimate desire for imperial appropriation” which, in (traditional) science fiction and contemporary exploration, “is rarely far away” (Seed 2011, 10). Finally, “if colonial wounds are consequences of systemic and hierarchical social classifications, and social classifications are hierarchical epistemic inventions disguised as representations, then healing colonial wounds becomes a matter of epistemic and aesthetic reconstitution,” as Mignolo (2021, 11) has argued. This chapter therefore traces Chiang’s epistemic and aesthetic reconstitutions of exploration and discovery.

Chiang’s short fiction establishes a continuity between scientific speculation, philosophical inquiry, and fine-grained social analysis embedded

into literary thought “experiments that integrate philosophy, semantics, physics and religion into sprawling (albeit concisely rendered) meditations on epistemology and life” (Loudis 2019, n.p.). Chiang’s short stories ultimately seem to confirm J. G. Ballard’s famous claim “that it is inner space, not outer, that needs to be explored” in science fiction (1996, 197): more than anything else, it is discovering subjectivity that takes center stage in Chiang’s writing because, his work suggests, it is precisely the structure and conditions of human cognition that need exploring, and the relationship of all cognitive operations to networks of power that need scrutiny.

Exploration as Recognition, Scientific Discovery as Anti-progress: “Exhalation”

Scientific discovery as the last ‘uncharted frontier’ is historically grounded in the colonial, Eurocentric fantasy of advancement, progress, development, and imperial appropriation.² European exploration (literally in traveling and in discourses of knowledge), under the umbrella of colonial scientific exploration, helped to produce and maintain knowledge of Europe itself, “framed by Europe’s sense of difference from the places and cultures that were being explored and reported on” (Ashcroft et al. 2007, 90). Once ‘explored’ and so ‘known,’ places, people, and discourses are cataloged as under the control of the colonizing powers. Jean-François Lyotard, in his critique of the ‘postmodern condition,’ contends that various factors, notably including ‘progress in the sciences,’ have contributed to the loss of confidence in metanarratives (1984, xxiv). Lyotard criticizes the enterprise of Western science and challenges the general paradigm of progress in science and technology, “to which economic growth and the expansion of sociopolitical power seem to be natural complements” (1984, 8). The notion of progress, Lyotard argues, is a necessary outgrowth of the sociopolitical legitimacy of the West: “It represents nothing other than the movement by which knowledge is presumed to accumulate” (1984, 30). Ashcroft, Griffiths, and Tiffin argue that Lyotard’s post-structural and postmodern critique about the ideological construction of scientific knowledge finds echoes in the field of postcolonial criticism, which “lays stress on narrative as an alternative mode of knowledge to the scientific, and draws out the

2 SpaceX’s now successful commercialization of civil space flight is a powerful trigger, in this sense, to think about a beginning corporate-imperial reach into space, at the time of this writing perhaps the most recent continuation of a historically grown and visceral entanglement of science and seizure.

implications of this for our view of the relationship and privileging of contemporary scientific ideas of ‘competence’ over ‘customary knowledge’” (Ashcroft et al. 2002, 163).

Against the grain of Western affirmations of progress as criticized by Lyotard and proceeding from Ashcroft, Griffith, and Tiffin’s insistence on alternative ways of knowing offered in narrative, we argue that Ted Chiang’s short stories offer literary thought experiments about human / more-than human scientists (and their findings) which reframe scientific discovery as necessarily circular, oftentimes paradoxical, and productively ambiguous against dominant cultural narratives of linear, teleological advance and utility or marketability on the commercial-imperial plazas of a globalized economy.

We read Chiang’s narrative reframing as an alternative epistemology of discovery in “Exhalation” and “Story of Your Life,” arguing that this effect is realized, in both cases, through the image of scientific discovery folding back onto itself, revealing (and celebrating) inescapable subjectivity and, in the same move, depicting invariable determinism. Nothing new is to be discovered, only a recognition of the ways and means by which this discovery happens. Exploration, in these two narratives, yields the phenomenology of discovery, while the physically determined universe remains constant and, invariably, the same. What comes to light is all of science, as “Exhalation’s” protagonist realizes, as “a solipsistic periscope” (Chiang 2019, 43).

“Exhalation” narrates a non-human mechanical scientist’s discovery that their chromium world is moving towards the end of life—powerfully summarized in the realization that “with every movement of my body, I contribute to the equalization of pressure in our universe. With every thought that I have, I hasten the arrival of” what they call “that fatal equilibrium” (Chiang 2019, 50). This statement summarizes the protagonist’s deductive journey towards understanding their chromium world’s laws of physics and its entire cosmology in a transformed way, raising a number of serious and complex philosophical issues: how to morally value and respond to the ‘end of the world’? What are the capabilities but also severe limitation of science and scientists to explicate and interpret crisis? “Exhalation” narrativizes an experimental process from observation to conclusion, yet in the process, it problematizes the causal and/or teleological relationship between these two end points.

The narrative considers a civilization of mechanical beings who depend for their motion, cognition, memory, speech, and feeling on air drawn from a great underground reservoir—“the great lung of the world, the source of all our nourishment” (Chiang 2019, 38). Air is extracted from

this reservoir to fill and refill individual “mechanical lungs,” containers of pressurized air, to power these beings, to the effect that “all that we are is a pattern of air flow” (48). Soon, however, realizing that “the pressure of our surrounding atmosphere [is] increasing” because, as is inferred, “our universe is a sealed chamber rather than an open well,” the protagonist reasons that “air is gradually accumulating within that chamber, until it equals the pressure in the reservoir below” (50). This central observation explains the narrative’s opening, beginning the story by foreshadowing a grand cosmological inversion: “It has long been said that air (which others call argon) is the source of life. This is not in fact the case and I engrave these words to describe how I came to understand the true source of life and, as a corollary, the means by which life will one day end” (37).³

The protagonist, drawing from the realization that this world is not an infinite, boundless expanse but a closed system governed by entropy, comes to understand that “in truth”—thereby effectively challenging and revising his world’s established body of knowledge—“the source of life is a *difference in air pressure*, the flow of air from spaces where it is thick to those where it is thin” (2019, 50, original emphasis). This ‘conceptual breakthrough’ marks a key moment in the general plot of “Exhalation” and, on a structural level, functions as a turning point—because from here on, the protagonist shifts from narrating his process of discovery to pondering its deeper significance, as he states, that “people contemplated for the first time that death was inevitable” (2019, 51). As Peter Nicholls has argued, “altered perception of the world, sometimes in terms of science and sometimes in terms of society, is what sf is most commonly about” (2016, n.p.). Chiang’s “Exhalation” also employs conceptual breakthrough as a common science fiction genre device but uses the experimental space of this literary strategy to open up the narrative to a meta-reflection on the very nature of discovery and exploration. This reflection is taking place on, or rather coded into, “Exhalation’s” frame narrative.

The story is delivered from the first-person perspective of an auto-diegetic narrator who presents the text as his engravings on a copper plate, recording his world’s slow-motion apocalypse for whoever might, in a distant future, access his chromium world as explorers. Readers are directly addressed and thus involved in the narrative, put in the position of those future historians and explorers the engraving is intended for. In this way,

3 For a detailed analysis of the central role of air in the short story, along with its exploration of apocalypse in its literal meaning as ‘revelation’, see Herche and Kern, 2021.

the text is positioned as a time capsule that forms an integral part of the narrative's structure.

It is the central idea and image of the "solipsistic periscope," introspection in the most literal sense exercised by the scientist protagonist in autodissection, the performance of an auto-craniectomy, which provides the 'apocalyptic'—revelatory—insight that their universe is not an expanse of open space and that their very acting and being in the world is inevitably going to cause their own demise. This image of the solipsistic periscope is "Exhalation's" central conceptual metaphor: "I was an everted person, with my tiny, fragmented body situated at the centre of my own distended brain" (Chiang 2019, 46). "Exhalation" relates to science fiction because of its minute procedural detail, writing an account of the protagonist's experimental method and process. However, in precisely this aspect, the narrative erodes and destabilizes the idea that there could ever be such a thing as 'objective' scientific methodology and discovery, scientific practice detached and critically removed from the scientist's subject position. This subject position—radical subjectivity in the recourse to the knowing subject, their process of generating embodied knowledges, the phenomenology of knowing—makes "Exhalation" a postcolonial response to the imperial architectures of knowledge as a tool for domination.

"Exhalation" depicts 'scientific discovery' to the extent that a central physical paradigm is being reformulated. Yet for the inhabitants of the chromium world, this Copernican shift in understanding their universe and the ripple effects of this shift take an inward direction. "Exhalation" offers, therefore, a quasi-spiritual twist to and critical assessment of narratives of teleological 'advance' and scientific progress. In this way, "Exhalation" serves as a space to revisit cultural narratives of exploration and discovery, revealing the histories of violence that, as Esme Murdock puts it, "white supremacist colonization, imperialism and capitalism have created and continue to create" (2021, n.p.). In this scenario, 'discovery' is folding back onto itself in at least two ways: in laying bare the inevitability of physical determinism and certain death (a rejection of the idea of immortal, imperial *man*) and in rerouting the protagonist's line of vision from their 'object' of investigation (his mechanical brain and, by extension, the physical universe) towards their own subjectivity. The protagonist here beholds the "irony in the fact that a study of our brains revealed to us not the secrets of the past but what ultimately awaits us in the future" (Chiang 2019, 53). "Exhalation" thus not only depicts but performs a thought experiment, as structurally described by Catherine Z. Elgin: speculative set-ups which depart from what is familiar to enhance an understanding of the familiar world, "to disclose barely detectable, or standardly overshadowed aspects

of nature” (2014, 226) and, as in this case, to foreground standardly marginalized aspects of subjectivity in scientific discovery. In short, thought experiments are “imaginative exercises designed to disclose what would happen if certain, perhaps unrealizable, conditions were met” (226).

From a postcolonial viewpoint, “Exhalation’s” plot structure and repertoire of images works to destabilize notions of scientific objectivity and mono-directional “inquiry” and/or exploration, which ultimately translates into a critique of Western epistemologies. The narrative protagonist assumes that “the same fate that befell me await[s] you?”—again addressing readers as the recipients of his engraving. The protagonist fantasizes that if, perhaps, a “neighboring universe has its own inhabitants, [...] [w]hat if they were able to create a conduit between the two universes and install valves to release air from ours? They might use our universe as a reservoir, running dispensers with which they could fill their own lungs, and use our air as a way to drive their own civilization” (Chiang 2019, 55). However, the protagonist rejects the extractivist implications of this fantasy, for they caution the reader (viz. the future historian or explorer to come to this chromium universe), hoping that this reading as expedition “was more than a search for other universes to use as reservoirs” and that the encounter was driven instead by “a yearning to see what can arise from a universe’s exhalation” (56).⁴

If, as Leanne Betasamosake Simpson powerfully argues, “[t]he alternative to extractivism is deep reciprocity [...] respect, it’s relationship, it’s responsibility” (2017, 75), what implications does this have thinking about the ‘Other’? This latter aspect is perhaps even more explicitly rendered in “Story of Your Life” and its strong emphasis on encounter, which we read in the following section of this chapter.

4 “Exhalation” culminates in a meta-critique of exploration and discovery in proposing a politics of encounter. In the protagonist’s final words, there is a profound sense of hope that reading as a space of encounter should be a reciprocal act of deep listening wherein relations of power can be transformed: “Though I am long dead as you read this, explorer, I offer to you a valediction. Contemplate the marvel that is existence, and rejoice that you are able to do so. I feel I have the right to tell you this because, as I am inscribing these words, I am doing the same” (Chiang 2019, 57).

Destabilizing Otherness and/in Language: “Story of Your Life”

“Story of Your Life” is the story of a linguist, Louise Banks, who is tasked with establishing communication with an alien species that arrived without warning on Earth. These visitors, with “radially symmetric” bodies, having seven limbs which could serve as arms or legs, and seven lidless eyes ringed on top of their body, look a bit like squids and are referred to by their human interlocutors as heptapods (Chiang 2002, 117–18). According to Jessica Langer,

a mutual central focus of science fiction and (post)colonialism is that of otherness: how it has been conceptualized, acted upon and subverted. Politically and pragmatically, the distinction between self and other has functioned as a method of control in colonial societies, creating a power hierarchy predicated both on physical and cultural difference and on enforced Foucauldian differentials of knowledge. In science fiction, otherness is often conceptualized corporeally, as a physical difference that either signposts or causes an essential difference, in a constant echo of zero-world racialization. Although this concept of alienness does not always signify a colonial relationship, it often dovetails with the colonial discourse of the Other. (Langer 2011, 82)

By exploring an alien visitation, “Story of Your Life” is, in fact, operating a well-known science fiction trope. The linguist and protagonist Dr. Louise Banks is deployed by the US military to establish contact with this alien species and to decipher both their spoken language and their script. The story, however, quickly changes from an engagement with the alien Other to a (mental) auto-dissection of the human protagonist herself. Heptapod B, the alien script expressed in so-called semagrams, “seemed to be something more than language,” Louise Banks hypothesizes:

they were almost like mandalas. I found myself in a meditative state, contemplating the way in which premises and conclusions were interchangeable. There was no direction inherent in the way propositions were connected, no ‘train of thought’ moving along a particular route; all the components in an act of reasoning were equally powerful, all having identical precedence. (Chiang 2002, 152)

Heptapod B, consequently, is “changing the way I thought. For me, thinking typically meant speaking in an internal voice; [...] my thoughts were phonologically coded [...] With Heptapod B [...] my thoughts were becoming

graphically coded” (151). A quirk of the heptapod writing system is that one must know how a sentence will end before one begins to write it: “As far as anyone could tell, there was no preferred order when reading the semagrams in a sentence; you could almost start anywhere in the nest; then follow the branching clauses until you’d read the whole thing” (146). Louise’s discovery in learning the heptapod written language is that she understands the existence of a wholly different perception of time, which results in a different kind of worldview. It is gradually revealed that Banks has internalized the aliens’ perception of time while acquiring their written language, which then enables Louise to, in fact, *remember the future*. “For the heptapods all history is simultaneous, and they are able to see what the future holds as well as what has already occurred” (Lucking 2017, 131).

Instead of a linear conception of time, “Story of Your Life” proposes not only a non-linear but also a non-sequential understanding of time, which highlights simultaneity, suggesting that (the discovery of) language can be a catalyst for social change. What happens when beings (human or non-human), and with them ideas, words, languages, concepts, and worldviews migrate between people, between planets? In a sense, language does not function as a mere tool for representing reality. Language actively shapes Louise’s relationships and interpersonal reality. If, as Langer holds, “[t]he figure of the alien [...] and the figure of the far-away planet are deep and abiding twin signifiers in science fiction” (2011, 3), “Story of Your Life” destabilizes this twin signification and engages in what Walter Mignolo (2021) theorizes as a central aspect of thinking decolonial options: the epistemic de-linking of visitation and colonial appropriation, and encounter as a dialectic of difference.

In the juxtaposition of two worldviews that differ from another but that can be exchanged as a gift and adapted, the story does not foreground otherness, but returns to that which is shared. Louise realizes that the alien’s “formulation of physics was indeed topsy turvy relative to ours” (Chiang 2002, 145): “Humans had developed a sequential mode of awareness, while heptapods had developed a simultaneous mode of awareness. We experienced events in an order, and perceived their relationship as cause and effect. They experienced all events at once, and perceived a purpose underlying them all.” However, the idea of radical difference is being eroded as the protagonist is told about their shared ancestry: “[w]hen the ancestors of humans and heptapods first acquired the spark of consciousness, they both perceived the same physical world, but they parsed their perceptions differently” (159). “Their approaches were almost reverse of one another,” but importantly, both human and heptapod notations “were systems for describing the same physical universe” (145). Despite

the protagonist gradually realizing her initial methodological limitedness in her human sequential modes of being, the story does not read the linguist's discovery as a new, superior way to read the world, but enables her to transform in a third space in their encounter: "The physical universe was a language with a perfectly ambiguous grammar. Every physical event was an utterance that could be parsed in two entirely different ways, one causal [the human way] and the other teleological, both valid, neither one disqualifiable" (159). Hence, the physical world allows for more than one worldview, necessitates more than one 'truth,' encourages different modes of rendering knowledge and, thus, gives rise to more than one discovery.

Instead of the denial of one's own positionality in the process of research, discovery is interpreted as sparking awareness, reciprocity, and relationality. In a postcolonial reading of "Story of Your Life," we encounter a re-framing of first contact as deeply transformative, and the affirmative mode creates a powerful counter-narrative to visions of hostile takeover: quite on the contrary, the narrative rejects tropes and visions that much of (especially popular) science fiction is so replete with, such as the inevitability of conflict in first encounter. Both parties must reciprocate in order to be able to communicate. The exchange itself is the ultimate goal, a reformulation of what is already known to humanity re-phrased and refracted in the mode of Heptapod B: a mirror image, like a *mimicry* which is both subversive *of* and enriching *to* human epistemological frameworks.

The role of scientific discovery takes center stage in this narrative. The protagonist's fieldwork, the major driver of the plot, occupies most of the narrative—speculation, deriving data, the evaluation of premises and conclusions, the testing of hypotheses, the determination to retry in cases of sure failure (of which there are many). This process acts as a powerful plot device slowing the narrative pace and, by extension, the reading pace, compelling the reader to engage deeply and participate intellectually—and emotionally—in a process that resists oversimplification or broad generalizations. Science fiction can here be claimed to pave the way to imagine not only new ways of being in but also, as in "Exhalation," of *reading* the world, and hopefully to speak about it cooperatively: to co-author it, to co-theorize reciprocal modes of being in it.

The narrative ends abruptly and perhaps unfolds its biggest speculative potential precisely in this way: the reason for the aliens' visit remains a mystery for large parts of the text. "Indeed," the protagonist narrates, "sometimes they preferred to watch us silently rather than answer our questions. Perhaps they were scientists, perhaps they were tourists" (137). As quickly as they arrive, they leave. Both their arrival and their sudden departure remain unsolved, open questions. "We never did learn why the

heptapods left. Any more than we learned what brought them here, or why they acted the way they did" (171).⁵ The central challenge that the narrative poses to readers in the heptapods' final absence, therefore, is the reader's ability or willingness to embrace what the heptapods in textual presence signified all along: that there is no difference between question and answer, that the answer is known long before the question could be asked (and vice versa); that both are identical, just as premise and conclusion are identical.

"Story of Your Life's" contact narrative is one that privileges cooperation and transformation of one scientist but not one of a necessary revolution of humanity. Congruent with the heptapods' worldview—a cyclical rather than causal epistemology—discovery is not necessarily linked to notions of progress, let alone exploration for conquest. The emphasis is, therefore, on responsibility rather than exploitation, on inward-looking contemplation of subjectivity rather than casting a gaze at the perceived other. This figure of thought unites both "Exhalation" and "Story of your Life."

Conclusion

In summary, both narratives discussed in this chapter, in their engagements with exploration and scientific discovery, invite postcolonial scrutiny of representations of progress. They do this by reflecting on processes and methods of research, disengaging discovery from imperial fantasies of advance. Returning to (and celebrating) inescapable subjectivity in rejection of imperial desires for 'objective' knowledge—such as in the image of the solipsistic periscope—both stories discussed in this chapter privilege moments of *recognition*, as theorized by Amitav Ghosh:


A moment of recognition occurs when a prior awareness flashes before us, effecting an instant change in our understanding of that which is beheld. Yet this flash cannot appear spontaneously; it cannot disclose itself except in the presence of its lost other. The knowledge that results from recognition, then, is not of the same kind as the discovery of something new: it arises rather from a renewed reckoning with a potentiality that lies within oneself. (Ghosh 2016, 4–5)


5 Denis Villeneuve's adaptation *Arrival* (2016) tackles this question in, granted, a cinematic need to entertain. Yet this answer substantially risks oversimplification in the move to explain the *discovery* of benevolent extraterrestrials who bestow upon humanity the 'gift' of non-linear consciousness so humanity will be equipped to help them, one day, in the distant future. This filmic reproduction of a familiar colonial trope has no grounding in Chiang's original text.

Both narratives engage with the issue of power in processes of knowledge production: as noted in the introduction, the question of who constructs knowledge and for what purpose is central to postcolonial critique at large and is a central preoccupation in postcolonial science fiction. Ted Chiang's works share this preoccupation, and, understood as narrative versions of what Elgin calls the "laboratory of the mind" (2014, 227), they transform staple elements in cultural imaginaries of science.

Both "Exhalation" and "Story of Your Life" confront standard interpretations of discovery as progress and a teleological movement 'forward.' Against the linearity of discovery and its colonial affiliations as a practice of appropriation, the two narratives privilege circularity and illuminate the inescapability of subjectivity at the heart of scientific inquiry. Foregrounding the discovering subject, discovery is re-framed as (self-)recognition and inward orientation—hence, a refusal of the imperial reach outward in its aim to contain and possess. This celebration of subjectivity is closely linked, in both narratives, to establishing frames of ethical encounter and the construction of equitable relationships. Especially "Story of Your Life" reads as a literary experimentation with radical reciprocity. Where classically, in science fiction "[t]he figure of the Alien comes to signify all kinds of otherness [...] as simultaneous desire and nightmare" (Langer 2011, 4), Chiang's rendition of visitation and encounter destabilizes cultural narratives of radical difference from literally within. What if, "Exhalation" and also "Story of Your Life" ask, all of science is a solipsistic periscope?

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“I’m a Patented New Fucking Life Form”: Scientific Knowledge-Making Practices and Practices of Knowing in Larissa Lai’s Utopian Fiction

ABSTRACT This article explores how Larissa Lai’s utopian speculative fiction novels *The Tiger Flu* (2018) and *Salt Fish Girl* (2002) critique asymmetrical power relations within (Western) scientific knowledge-making practices. Via the dystopian principle of extrapolation, they project threatening tendencies in scientific practices into the future and thereby engender a reflection on the trajectories of neo-/biocolonialism and capitalist science. The utopian impulse in Lai’s dystopian scenarios thus consists in their envisioning of collaborative knowing as alternative to Western scientific knowledge-making practices. A feminist new materialist reading of her novels highlights these narratives’ vision of reimagining ‘the human’ as only one among many more-than-human agencies. By thus reframing knowledge as a material practice, the novels contemplate how we can know inclusively and ethically beyond powerful (Western) knowledge-making practices. Through examining how the novels contrast new epistemic communities with established ideas of knowledge and how they formulate new ways of thinking that contradict prevalent tendencies during the time of their publication, this article maintains that Lai’s powerful narratives sow the seeds of more-than-human postcolonial epistemologies that can sprout urgently needed u(s)topian possibilities of re-worlding.

KEYWORDS biopiracy, epistemology, Larissa Lai, new materialism, speculative fiction

Introduction: Patenting “Life”

“I’m a patented new fucking life form” (Lai 2002, 158)—this short quotation from Larissa Lai’s speculative fiction novel *Salt Fish Girl* entangles scientific knowledge practices with multiple ideological and capitalist facets. “I am” signals subjectivity and *Dasein*, which is traditionally considered an exclusively human capacity. “Patented,” in contrast, refers to a product and, thus, to relations between science and capital. When the clone Evie labels herself a “patented new fucking life form,” she hence simultaneously indicates neo- and biocolonialist scientific practices which build on and reinforce the anthropocentric distinction between agential subjects and exploitable bare lives.

Concepts such as neo- and biocolonialism, or biopiracy, target relations between science and knowledge and foreground how knowledge-making practices are embedded in ideological systems that render them neither neutral nor independent from discursive practices. Generally speaking, reflections on *what* we know and *how* we know have re-surfaced as urgent concerns during what is now commonly labelled the Anthropocene.¹ Due to climate change and the COVID-19 pandemic, for instance, ‘Science,’ frequently perceived in quotidian discourse as a homogenous concept with a capital S, has resurfaced as a prominent subject of public interest and debate. Knorr Cetina diagnoses contemporary Western societies as “knowledge societies,” with expert processes and systems “epitomized by science but structured into the diverse areas of social life” (2003, 1–3). Underlining that science is only *one* among many mechanisms of knowledge production, albeit the “premier knowledge institution throughout the world” (1–3), she identifies the “lack of understanding of the contemporary machineries of knowing, of their depth and particularly of their diversity” as a “problem area” (2–3).

Via the dystopian principle of extrapolation, Lai’s speculative fiction novels *The Tiger Flu* (2018) and *Salt Fish Girl* (2002) extrapolate asymmetrical relations within knowledge-making practices and project them into the

1 The term Anthropocene was suggested by Crutzen and Stoermer in the year 2000 to highlight that the current geological epoch is shaped by humankind’s transformative, i.e., devastating, impact on the Earth and the atmosphere. While this term has become an established denominator of the need to change ‘the human’s’ lifestyle and economy, it is also controversially discussed due to its inherent false universalism and its links to Western grand narratives (see Malm and Hornborg 2014; see Boller 2021 for a detailed discussion of feminist utopian fiction’s engagement with Anthropocene discourse and its binary reaction to crises).

future. On the one hand, they thus envision the dire consequences of an anthropocentric and Eurocentric understanding of scientific knowledge-making practices that styles the more-than-human world and all human lives discursively aligned with it as passive matter and, thus, an exploitable object of study. Lai's narratives thus throw into relief how such practices—when entangled in relations of domination, subjugation, and exploitation—can result in the objectification and ensuing colonization of everything categorized as 'nature' and 'Other.' Thereby, the novels engender a reflection on the trajectories of neo-/bio-colonialism and capitalist science in a dystopian world in which harmful relationships between knowledge formations, scientific practices, and social as well as environmental (in)justice shape the lives of human and more-than-human beings.

On the other hand, the critique of such practices of biotechnology and genetic engineering in *Salt Fish Girl* and of the ecomodernist, trans-humanist belief in technology in *Tiger Flu* is paired with a more optimistic outlook. Lai imagines collaborative knowing as an alternative form of knowledge that refrains from hierarchical, asymmetrical power relations and exploitation. Her vision of knowing relates, in some respects, to new materialism, with which the novels share the impetus to reposition human agency as only one form among more-than-human agencies. In Barad's new materialist account, knowing and experimenting are "*discursive practices*" and thus "*material (re)configurations of the world*" that do not describe but, rather, produce the "subjects and objects of knowledge practices" (Barad 2007, 147–49; emphasis in original).

The novels hence invite a reading through a new materialist lens. Such an approach throws into relief how Lai's narratives imagine an alternative conception of knowing as a glimpse of hope and possibility despite the bleak scenarios. From this perspective, *Salt Fish Girl* and *The Tiger Flu* cannot only be read as dystopian cautionary tales but also as postcolonial utopias. According to Margaret Atwood, the term utopia foregrounds how utopia and dystopia always contain "a latent version of the other" (2011, 66) and are both "mappable locations and states of mind" (75).

The following contribution examines how Lai's novels dismantle established capitalist and colonialist thought structures in science as well as the idea that 'the human' can simply repair the damage done to the planet with effective technologies. It is interested in how the novels contrast collaborative onto-epistemological visions with established Western ideas of scientific knowledge. The main argument of this article is that the novels reframe knowledge as an intra-active, collaborative process of knowing and thereby offer a vision of how we can know inclusively and ethically beyond powerful (Western) knowledge-making practices.

Critique and Utopian Vision: *Salt Fish Girl* and *The Tiger Flu*

Salt Fish Girl and *The Tiger Flu* are often discussed in the context of Asian-American and Asian-Canadian fiction. By drawing on Goellnicht and Ty's work in her reading of *The Tiger Flu*, Klimenko, for instance, highlights the "rich tradition" from which Asian-Canadian creative writers and activists "draw for both their creative works and their political activism" (2020, 164). These two aspects—creative output and activism—are often inseparably entwined and further entangled with Lai's scholarly work in critical and academic discussions of Lai's novels. Apart from this, scholarly contributions on *Salt Fish Girl* and *The Tiger Flu* frequently highlight their special impetus in regard to knowledge and ethnicity. In such readings, the discourses and thought traditions of the Enlightenment, as a Western movement, figure prominently.² Olsen, for instance, underlines how Lai's novels focus on race and ethnicity to interrogate 'the human' as "conceptualized by Enlightenment discourse" (2021, 145). She focuses on the "visuality of race" and on "colonialist and imperialist strategies of subjugation" (2021, 147) to reveal how the novel queerly reconstructs racialized Asian bodies "via its use of human–animal hybridity" (148), whereas Joo, for example, discusses how *Salt Fish Girl* reinterprets "the racialized Asian character" (2021, 47) when it traces capitalist exploitation (52). Reimer (2010, 4) particularly highlights the productively critical momentum of *Salt Fish Girl*, arguing that the narrative offers a "critique of the dominant Enlightenment discourses that emphasize disembodied rationality, progress, and certainty to the detriment of alternative epistemologies."

The notion of genre plays an essential role in such critiques and envisioned alternatives as well. When both novels imagine threatening future effects of (ideological) frameworks that racialize female Asian bodies, their various dimensions of speculation, imagination, and extrapolation tie in with their critique of the anthropocentric foundations of established approaches to knowledge. Following Foucault's work on power and knowledge, Wynter makes the case for regarding "the Renaissance humanists' epochal redescription of the human" (2003, 264) as already being in direct

2 Recent articles on Lai's two SF novels centre attention, for instance, on aspects such as fluidity in *Salt Fish Girl* (see Ma 2025), on health policies and planetary health commons in *The Tiger Flu* (Härting 2023), or on the latter novel's posthuman and postcolonial perspectives on science, including its play with techno-Orientalism (see Gatermann 2023). The alternatives to established binaries, which also inform science, and the forms of hybridity that Lai's novels imagine play a significant role in all of these scholarly contributions.

relation to colonialism and its asymmetrical distribution of power between colonizer and colonized. Vint, in turn, considers Western humanism as inadequate "to provide ethical and political frameworks sufficient to respond to growing economic and other inequality" (Vint 2020, 2). Building on Nalo Hopkinson's and Uppinder Mehan's observation that SF is commonly seen as a Western genre, Georgi places *The Salt Fish Girl* within the genre of cyberfiction and reads it in context with other works that seek to decentre the Western approach to science and technology in culture and literature (2011, 6–7). Georgi here explores the entanglement of science fiction, colonialism, and postcolonialism and pays particular attention to the ethnic body, which is marginalized and taken "for granted as 'spare parts'" in mainstream science fiction (2011, 7).

Lai's novels defy simple classifications; for instance, they can be regarded as science fiction, speculative feminism and fiction, or as cyberfiction. As speculative fiction that relies heavily on the dystopian principle of extrapolation, Lai's narratives are embedded in their particular historical moment and discourse. Written during a time when even public discourse talked about "The Biotech Century," as proclaimed by *Bloomberg Businessweek* in 1997, *Salt Fish Girl* critiques the inherent racism at the heart of biotechnology and the capitalist structures this scientific field became entangled with. *The Tiger Flu*, in turn, is set in a devastated world and deals with the repercussions of a pandemic. Although the 2018 novel today "feels almost prophetic" (Klimenko 2021, 161) with regard to the COVID-19 pandemic, it particularly critiques the workings of science that has lost sight of research ethics in a techno-scientific neoliberal world instead of warning of a pandemic in itself.

Both novels revolve around two women of colour—the mythical Nu Wa and the girl Miranda in *Salt Fish Girl*, Kora Ko and the clone Kirilow Groundsel in *The Tiger Flu*—whose chapters alternate, thus providing at least dual perspectives and inviting intersectional readings. *Salt Fish Girl* particularly resists Western reading habits because it resorts to circular and polyvocal myth. It thus does not follow the logic of history, which Lai regards as linear and monological, or a narrative structure that Lai terms patriarchal (Lai 2019). By centring the disenfranchised and othered in a future segregated and exploited, ruined world, they entangle different times and spaces, (knowledge) traditions, myths, and genres. Despite their dystopian scenarios, they do not issue simple warnings or give in to despair. *Salt Fish Girl* incorporates a utopian aspect through collaborations that seize the results of scientific practice. *The Tiger Flu* puts even more emphasis on the production, circulation, and application of knowledge within different epistemic communities to eventually imagine embodied,

post-anthropocentric knowing through rhizomatic entanglement. Lai's novels thus challenge and restructure the hierarchical epistemic patterns that 'use' racialized bodies as objects and instruments within colonial and capitalist scientific structures. Through their intersectional lenses and dual perspectives, her novels juxtapose diverse forms of knowledge that are related to colonizing and decolonizing endeavours, as the following chapters will show.

Salt Fish Girl

Salt Fish Girl begins with Chinese goddess Nu Wa's creation of human beings in the Pre-Chang dynasty. After Nu Wa's first rebirth as a human being, the first of the two convoluted storylines that form the novel follows Nu Wa, who is part fish, part human, and a "shape shifter who travels through time and space" (Georgi 2011, 274); and her lover, the Salt Fish Girl in nineteenth-century China. The second storyline centres Miranda, who eventually turns out to be Nu Wa's "reincarnated future self" (Mohr 2017, 51), and the clone Evie in a dystopian, corporate-controlled future (2044–2062 CE) Canada. Both storylines critique scientific knowledge-making practices that claim to neutrally know the world but that are embedded in capitalist and colonialist structures in general and profit from biopiracy in particular. On the level of discourse, the entangled and non-linear storylines produce queer temporalities which function as ideological critique (see Freccero 2015, 19–22) and which align with the "multi-directional, multi-perspectival, multi-dimensional" spaces and times of "queer horizons of utopian and dystopian literatures" that Marks et al. identify (2022, 15). On its different levels, the novel hence highlights and disrupts prevailing anthropocentric and Eurocentric systems as well as the (neo-)colonialist and intersectional exploitation of female racialized 'Others' in many different times and places.

Capitalist Science, Biopiracy, and Anthropocentrism

Lai's novel envisions a dystopian form of science that constitutes a dehumanizing practice when it becomes entangled with systems of exploitation. *Salt Fish Girl* particularly foregrounds biopiracy and the ensuing creation of disenfranchised more-than-human clones. Lai projects worrying developments of late twentieth-century biotechnological discourse and practice to the mid-twenty-first century, when Miranda grows up in "Serendipity, a walled city on the west coast of North America" (2002, 11). This dystopian view of scientific knowledge-making practices is embodied

by the scientist Dr Flowers, who appears as a personification of powerful capitalist science.

As a child, Miranda suffers from a strong durian smell, a "foul odour that emanated from [her] pores" (Lai 2002, 20–21) and marks her, the only Asian girl in her class, as threefold 'Other.' While attempting to find a cure for her condition to render her an invisible member of the highly regulated society residing within the walls of the city, Miranda's father puts his daughter's wellbeing at risk. This risk is maximized when he contacts the famous Dr Flowers, who experiments on patients suffering from the contagious Dreaming Disease, a strange illness that infects both the more privileged, but closely monitored, citizens working for corporations such as Nextcorp and the outcasts living in the Unregulated Zone. Specific strong body odours are one of the multiple symptoms of this disease, which gives infected people "the memory structure of other animals" (103). It makes them remember, for instance, all famines ever caused by war (101) and incites a "compulsive drive to commit suicide by drowning" (100).

One day at school, Miranda's friend Ian leads her into a secret corridor to show her a group of people, "dark bodies in blue uniforms" (Lai 2002, 75). Upon her question who these women are, her friend Ian answers that "They're not women. They're janitors. [...] Most of them illegal [...]. And they're primary carriers of the Contagion" (76), meaning the Dreaming Disease. The janitors alarm Miranda because

[t]he muscle and skin of their backs had been replaced with some kind of transparent silicone composite so that you could see their spines and behind them, their hearts pounding, their livers and kidneys swimming in oceans of blood and gristle. [...] [The] organs had been shifted. (Lai 2002, 76–77)

Miranda learns that Dr Flowers "rearranges the organs of the afflicted" during dissections on TV (Lai 2002, 76), which turn the de-humanizing and de-subjectivizing practice into a media-event. His dissections of living beings are reminiscent of vivisection, a practice carried out during the Enlightenment era to seek knowledge of the working of animals. Descartes, for instance, viewed non-human life in mechanical terms, i.e., as beings incapable of conscious experience. As Vint argues, Western thought, whether scientific, political, or philosophical, has tended to claim to know 'the Other' and thereby contributed to discriminatory practices via devaluation and devaluing (2020, 1). When viewed through this particular lens, the more-than-human world, as well as marginalized human beings associated with it, appears as an external 'Other' that becomes an object to

be studied. The idea that the “Asian body is actively produced and racialized *through* a complex economic and political history” (Joo 2014, 53; emphasis in original) triggers further reflection on the racialization of bodies through scientific knowledge-making practices that perpetuate constructions of ‘the Other’ as mere objects within the framework of Eurocentric conceptions of ‘the human.’

Lai’s society is clearly imagined as material-semiotic, i.e., as a network of not only bodies but also discourses (Haraway 2016, 13). This term alludes to integral mechanisms that new materialism raises awareness of in its attempts to deconstruct human exceptionalist logic and to disconnect epistemologies from Western-centred hierarchy systems or linear narratives of progress and of human-only agency. In the short passage quoted above, Lai directs attention to the discriminatory treatment of marginalized groups—in this case, non-white women without a legal entitlement—in medical research that connects to an inadequate humanism which defines some people as sub-human, often based on ethnicity. The capitalist framework further increases the cruelty of scientific practice devoid of ethical reflection. Dr Flowers seeks knowledge through experiments carried out on desperate patients and on human beings who are not considered sufficiently human, which stresses the ideologically informed difference between test subjects and those parts of the population apparently considered worthy of protection.

As Georgi points out, Miranda’s friend Ian functions “as the voice of the company doctrine, and by extension as that of the cultural mainstream” (2011, 281). Ian’s explanation that the janitors are not women, illegal, and carriers of the disease shows how they are stripped of their humanity in a reciprocally dependent relationship: discourse defines them as illegal contagious beings and thus induces their transformation into test objects of medical science. Furthermore, the experiments solidify their status as “not women” and non-human, rendering their bodies exploitable matter that can be ‘known’ through experimentation as scientific practice. Flowers’ experiments effect the denial of humanity and personhood but also of agency to the janitors, whose lives are defined as necessary sacrifices in the endeavour to know the world. This denial highlights Barad’s above-mentioned argument (2007, 147–49) that the sciences, as discursive boundary-making practices, are also material (re)configurations that produce the subjects and objects of knowledge practices.

Miranda herself, already labelled a “perfect subject for [Dr Flowers’] current drug trials” (Lai 2002, 71), only escapes from the “gut-splitting, organ-rearranging surgery” (80) due to her father’s discharge from the company Saturna and her family’s ensuing forced move to the Unregulated

Zone beyond the borders of the walled city. Some years later, however, she becomes Flowers' apprentice—or accomplice—at his private clinic, where she first meets her lover-to-be Evie. The young woman shatters Miranda's worldview when she informs her about the biocolonialist biotechnological practices the corporations employ to increase their profit. Miranda does not want to believe that Evie is a clone and, thus, one of Dr Flowers' creations³ produced to serve as cheap labour force for the shoe company Pallas. Miranda's reaction exemplifies a naïve and human exceptionalist thought pattern when she states that, with regard to cloning,

"Animals and plants are allowed, but not humans."

"I'm not human." [Evie responds]

I recoiled slightly.

"My genes are point zero three percent *Cyprinus carpio* — freshwater carp. I'm a patented new fucking life form." (Lai 2002, 158)

While Flowers' earlier research and experiments relied on othering and the exploitation of racialized lives, the production of clones further proves the biased system of knowledge-making practices of a decisively capitalist science that cannot be disentangled from the corporations' interest in the maximization of profits.

Evie and her 'sisters,' called the Sonia series or Sonias, are all-female human–fish clones modelled on Asian women. Their existence and treatment expose anthropocentric as well as colonialist thought structures and practices, as they epitomize objectivization and commodification within practices of biocolonialism, or rather biopiracy, because—as Evie explains—"Nextcorp bought out the Diverse Genome Project⁴ [...]. It focused on the peoples of the so-called Third World, aboriginal peoples, and peoples in danger of extinction" (Lai 2002, 160). Lai's novel here builds on historical practices that treated racialized bodies as "*objects* of study of science and discovery in the construction of a Western imperialist worldview" (Joo 2014, 55; emphasis in original). As Georgi stresses, the production of female clones modelled on peoples of the Global South emphasizes the role of gender and ethnicity in commodification processes (2011, 186) that can be traced back to the beginnings of biocolonialism, when human beings and more-than-human materials were brought to Europe "for imperial

3 Originally created to become Flowers' daughter, Evie is sent to the factories when she rebels against her maker.

4 This term is "a thinly veiled reference to the Morrison Institute's Human Genome Diversity Project" (Joo 2014, 55).

interest, knowledge, and profit” (Ashcroft, Griffiths, and Tiffin 2013, 28–29). The contemporary practice of patenting “plants, animals and human genes as profitable sources” of diverse products has become a whole industry during the “biotechnological revolution” (Ashcroft, Griffiths, and Tiffin 2013, 28–29). Shiva draws a connection between discovery, colonization, and trade in the past and science, patenting, and capitalism today. The term biopiracy is now commonly used to criticize the patenting of peoples’ genetic material. The practices of biopiracy commodify genes, resources, and even knowledge of peoples still considered “underdeveloped” (Ashcroft, Griffiths, and Tiffin 2013, 28–29). By stressing that the colonialist seizure of land was a “violent takeover [which] was rendered ‘natural’ by defining the colonized people as nature, thus denying them their humanity and freedom,” Shiva (2004, 2–3) also convincingly draws parallels between early colonialism, the colonization—and devastation—of what has been labelled ‘nature,’ and of bodies through acts of biopiracy. The justification of the colonization of ‘nature’ is thus firmly rooted in Eurocentric human exceptionalism (see Olsen 2021, 148, 157).

The existence of the clones, therefore, is only rendered possible within a framework that excludes specific human groups from the anthropocentric privileges determined by the Global North. Knowledge is always co-produced by “natural and social orders,” as Jasanoff stresses (2010, 2), and the biotechnological creation of the clones exemplifies Western human exceptionalist logic. Only produced to function as cheap labour force for the factories, the Sonias showcase the objectification of non-Western women and the more-than-human. Joo poignantly summarizes the reality produced by a culture that disregards the intrinsic value of all beings not included in ‘the human’: “Evie and her ‘sisters’ are illegal not because they are clones; they were cloned precisely to be illegal, so that their status as non-humans automatically and inherently excludes them from human rights” (2014, 54).⁵ Their deliberate creation as racialized and animalized hybrid beings hence legitimizes their exploitation, as they are not eligible for human rights within predominantly anthropocentric ethics.

Lai’s novel thus critiques the powerful influence of capitalism and anthropocentrism on scientific practices. Through her extrapolation of worrying developments during the biotechnological revolution, *Salt Fish Girl* repeatedly imagines excesses of unchecked, capitalist science, highlighting that, when embedded in colonialist and capitalist structures, the

5 See Reimer (2010) and Olsen (2021) for a discussion of the clones’ hybridity in relation to Enlightenment epistemologies.

sciences cannot produce an objective knowledge that maps and models the material world. Nevertheless, the novel’s ustopian impulse shows when the alleged objects of Dr Flowers’ experiments rebel by engaging in knowing as collaborative practice, as the following section outlines.

Boarding the Enemy’s Ship: From Biopiracy to Collaborative Agency

Despite biopiracy and an apparently deeply pessimistic dystopian outlook, *Salt Fish Girl* incorporates a ustopian impulse. The collaboration of alleged objects results in the re-appropriation of the outcomes of the scientific practices that exploited them. The Sonias take advantage of scientific experimentation with human / plant hybrids that implanted

human genes into fruit as fertility therapy for women who could not conceive. And of course the pollen blew every which way and could not be contained [...] [T]he fruit of certain trees could make women pregnant without any need for insemination. It was great for [the clone community] because [the corporations] only manufacture women. (Lai 2002, 258)

The corporations’ and Flowers’ biopolitical attempts at controlling life hence backfire because agency is not an exclusively human attribute but must, rather, be understood as a relationship between agential matters and, thus, as a “matter of intra-acting” (Barad 2007, 178). When the Sonias reclaim their bodies and reproduce with the help of genetically engineered durian trees, they engage in a “long-term subversion” that also targets the capitalist production cycle (Georgi 2011, 294). The Sonias’ acts of defiance are enabled by collaborative material practices, such as experimenting. Their ethics of knowing includes various forms of agency that together take advantage of Flowers’ disregard of how the more-than-human world partakes in knowing instead of being passive matter to be shaped by culture and science.

From biopiracy and exploitation springs a collaboration of the land, transgenic female clones, the bioengineered Eastern durian trees, and Miranda / Nu Wa, who is pregnant with a child she conceived by eating a durian fruit. Dr Flowers’ alleged objects powerfully demonstrate their agency through collaborative counteractions that engage in re-worlding beyond anthropocentric structures. Olsen delineates how the Dreaming Disease “breeds anxiety about nature” (2021, 148) in this context. The disease appears to be a weapon used by the land that is “fighting back” (Lai 2002, 244) when people contract it by walking barefoot and, thus, by coming into direct contact with the land they exploited and contaminated. As Olsen argues

with regard to *Salt Fish Girl*, recognizing that binaries and the colonization of nature are “built right into the architecture of our social structures calls into question the logics of discriminatory practices” and can thus probe “at the ethics of our relationships with other beings in the world” (2021, 158).

While Flowers is convinced that he has the right to engage in potentially dangerous practices and take control over living beings, he denies this right to the Sonias: “I’m a scientist, Evie. Whereas those Sonias [...] not human [...]” (Lai 2002, 256). Flowers eventually has most of the Sonias murdered and their durian tree destroyed when their rebellion against capitalist scientific exploitation threatens his work and profit as well as dominant discourses of human exceptionalism. Nevertheless, the multi-agential collaboration opens up visions of knowing and living that leave behind “the binary distinction human / non-human [that] has been foundational for European thought since the Enlightenment” (Braidotti 2019, 7). *Salt Fish Girl* hence imagines how different agencies and forms of knowing can profit from one another. This potentially subversive community symbolizes truly ecological and collaborative being and knowing informed by non-hierarchical difference and entanglement, which here implies connections, responses, and responsibilities that also involve “dispossessed others” (Barad 2007, 378).

This onto-epistemology makes the novel appear more utopian than dystopian, when it produces reality by reconfiguring and differentially enacting the “determination of boundaries, properties and meanings” (Barad 2007, 8). The more-than-human sympoietic (i.e., collectively producing) community (Dempster 1998, v) formed across space, time, and species repositions ‘the human’ as one agent among others and engages in the continuous process of meaning-making beyond anthropocentric structures. While *Salt Fish Girl* hence envisions how an ethics of inclusive knowing through intra-action and collaboration gives rise to post-anthropocentric hope, Lai’s more recent *The Tiger Flu* puts even more emphasis on different, both dystopian and utopian, forms and practices of knowledge.

The Tiger Flu

The Tiger Flu is set in the year 2145 and thus almost 100 years after Evie and Miranda escaped from Dr Flowers and Miranda gave birth to a girl, believing that “[e]verything will be all right [...] until next time” (Lai 2002, 269). Three different calendars are coherently used in the novel: United Middle Kingdom cycles, Gregorian years, and Cascadian years. The Gregorian year 2145 corresponds to the Cascadian year 127 TAO (Time After Oil). This date engenders a fascinating thought experiment in an alternative

world setting, since this calendar signifies the exhaustion of oil resources by 2018, the year of the novel’s publication. The world is not all right in this novel, which imagines a society suffering from the effects of ecological disasters, scarcity of food, extreme class divides, and the repercussions of the tiger flu pandemic. *The Tiger Flu* takes the utopian concerns of *Salt Fish Girl* some steps further: while the novel critiques the neoliberal use of genetic engineering as well as the transhumanist disregard of the material world and its multiple agential matters, its utopian dimension consists in a decolonized and non-capitalist form of being and knowing.

The two protagonists of the novel reside in different spatial realms: Kora Ko and her family struggle to survive not only the lethal tiger flu but also the dire living conditions in Saltwater Flats, the first quarantine ring around Saltwater City, which is ruled by Isabel Chow’s corporation HöST Light Industries. The second female protagonist, Kirilow Groundsel, is a groom, i.e., surgeon, in the clone community called Grist Village, which is attacked by HöST. The two storylines eventually merge when Kora and Kirilow meet at the Cordova Dancing School for Girls in Saltwater Flats. Despite loss, death, and destruction, the narrative develops surprising utopian ideas when Grist Village is eventually founded anew by Kora and Kirilow.

Grist Village and Saltwater Flats appear as almost diametrical oppositions regarding the epistemological, ecological, and ontological conceptualizations which shape these places and societies. They can thus be considered literal epistemic cultures, “amalgams of arrangements and mechanisms [...] which, in a given field, *make up how we know what we know*. Epistemic cultures are cultures that create and warrant knowledge” (Knorr Cetina 2003, 1). While Knorr Cetina conceptualizes this term as an alternative to ‘discipline,’ the notion of epistemic cultures and their respective practised “texture of knowledge” (2–3) can also be applied to the communities in Lai’s novel in a more literal sense. While Saltwater City is a techno-scientific knowledge society that has lost all hope for living in the material world, Grist Village and New Grist Village become utopian time-spaces through their alternative forms of knowing. A discussion of their disparate views and practices of knowledge allows for insights into how *The Tiger Flu* engages with ontology and epistemology to envision a new ethics of knowing.

Technology and Transhumanism: Saltwater Flats

In the odd-numbered chapters that focus on Kora Ko, Saltwater Flats appears as a dystopian extrapolation of contemporary tendencies with regard to bioengineering and corporate power within the framework of binary thought structures of Anthropocene discourse. Life is threatened

by the tiger flu, a disease first caused by tiger wine made from the bones of the once-extinct Caspian tiger that was biotechnologically re-animated by Kora's ancestors. More dangerous for men than for women,⁶ its fourth wave also hits Kora's brothers and her uncle Wai, as well as her already weakened mother Charlotte. Even people not afflicted by the flu suffer from the scarcity of food as well as from the collapse of the economy and of the currency. Simultaneously, "the ancient mainframe Chang rolls too fast across the sky. [...] [He] appears much bigger than he should because his orbit is fast deteriorating" (Lai 2018, 12). Although Chang is a looming reminder of the threat of further collapse, all hope is pinned on technology, up to the point of splitting the mind from the body and uploading it to Chang.

The dystopian aspects of *The Tiger Flu* critique the unreflective belief in technology by imagining how limited access to knowledge and processes of knowledge production can maintain and even deepen social divisions and (environmental) injustice. Similar to Miranda's long-standing quasi-deliberate ignorance, Kora's trust in technology and Isabelle Chow, the CEO of HöST, prevails for a long time. Like other inhabitants of Saltwater Flats, Kora relies on "information scales [...] plugged into the single-band halo that circles her head [...]. As soon as she can afford it, she'll add rings to her halo, or even a full helmet, so she can get wiser quickly. She needs all the help she can get" (Lai 2018, 12). The scales make knowledge literally graspable and reduce the complexity of knowledge and knowledge acquisition. Learning and comprehending have been replaced by a passive reception of knowledge in exchange for money in this epistemic community. Thereby, the system excludes all people from knowledge who cannot afford to buy scales. Simultaneously, the capitalist structure of knowledge acquisition is controlled by competing elites with totalitarian aspirations and is, thus, prone to abuse. Furthermore, neither the knowledge-system nor the direct implantation of knowledge into the human brain can repair the damage that has already been done. Kora once runs "past the scale exchange where denizens routinely swap out shimmering flakes and tendrils of information in a desperate attempt to know and so fix the broken world" (Lai 2018, 40–41). Such attempts, and the beliefs they originate from, are symptomatic of an ecomodernist belief in technology

6 As Gatermann highlights, the virus "discriminates [...] on the basis [...] of sex—ultimately putting patriarchy to rest" (2023, 86). While I do not entirely agree with the idea that the virus topples patriarchy, as its structures partially persist in Saltwater City, Gatermann's reading of this gendered and political dimension of the virus and of the symbolic status of the self-proclaimed tiger men is highly insightful (see 85–89).

as a saving grace, which is paired with a disregard of other agencies in the ecosystem ‘the human’ is part of.

Saltwater Flats sets all hope on the transhumanist idea of uploading the mind to Chang to leave the body behind. This upload requires not only the Lift—a technology invented by HöST, stolen by Marcus Traskin and later controlled by Kora’s brother after he murdered Traskin—but also the substance N-Lite, which appears as a cynical comment on the Enlightenment that privileged human reason, as Calvo Pascual emphasizes (2021, 101). In contrast to critical posthumanism, transhumanism aims at perfecting and enhancing ‘the human,’ which is indirectly conceptualized as an elitist club of those who can afford the technology transhumanism relies on, such as AI or genetic engineering. In her reading of *The Tiger Flu*, Calvo Pascual argues that “transhumanist philosophy, engaged as it is in the enhancement of the human being through technological developments, [is] a process which carries with it social exclusion and exploitation of the minorities that lack access to those alleged improvements” (2021, 101). It hence intensifies human exceptionalist ideology (Calvo Pascual 2021, 102) that critics such as Braidotti, Haraway, or Vint criticize for its perpetuation of asymmetrical and colonial power relations and forms of discrimination.

Lift visualizes biopiracy and colonialist paradigms even more than Dr Flowers’ experiments in *Salt Fish Girl*. HöST initially uses clones manufactured by the company Jemini as involuntary trial subjects but eventually raids Grist Village to capture the descendants of clones who escaped many years ago. Chow sacrifices the so-captured clones in the attempt to finalize her project, thereby exploiting them as cheap ‘material,’ as non-human lives that can be used as means to a capitalist end. Acts of biopiracy are manifold here: the Grist sisters were originally created from one Asian woman’s DNA to serve as a cheap labour force. During the Lift, their minds are uploaded, but their bodies are transformed into fish to be literally consumed by the ignorant citizens of Saltwater Flats waiting for the upload. Lift promises immortality and hence salvation from the flu but is only a “money machine” for Kora’s brother K2 (Lai 2018, 229). In K2’s hands, it leads to a mass murder of people whose minds will not lead the virtual life on Chang they were promised.

Due to its reliance on the colonization of lives considered “natural resources” and “raw material” (Calvo Pascual 2021, 108), Lift is presented as a dystopian vision of a supposed technological solution. Furthermore, as transhumanist practice, it is grounded on limited access to knowledge and denial of participation in knowing as practice; on the disregard of co-productions; and on the capitalist exploitation of those classified as different. *The Tiger Flu* suggests that such “technofixes” (Haraway 2016, 3)

do not bring about the utopia they promise. In fact, “Western science, fraught with a colonial and imperialist ideological heritage and driven by neoliberal capitalist interests, is ill equipped, the novel suggests, to provide solutions to contemporary global crises [...]” Gatermann argues (2023, 82). Instead of reproducing or simply criticizing such paradigms, Lai’s novel builds on what Haraway calls the stark need to “think together anew across differences of historical position and of kinds of knowledge and expertise” (2016, 7). In this regard, the even-numbered chapters narrated by Kirilow Groundsel provide a stark contrast to Saltwater City’s approach to being and knowing, as the next section outlines.

Towards Embedded and Embodied Knowing: Grist Village

Kirilow’s narrative at first depicts Grist Village as an alternative, though still flawed—and, hence, utopian—epistemic community before her storyline merges with Kora’s. I argue that the novel eventually provides a utopian vision of a rhizomatic and sympoietic form of knowing dismantled of colonialist, capitalist, and individualistic structures when Kora and Kirilow found New Grist Village.

As an alternative epistemic culture, Grist Village stands in stark contrast to Saltwater City’s transhumanist practices and exploitation of ‘the Other.’ The community relies on non-capitalist rules and structures as well as specific medical and scientific practices. Even though the Grist sisters were, just like the Sonias, originally produced within the framework of capitalist science, the re-appropriation of their lives and their practices of knowing allow for a first glimpse of utopian reworlding through the recognition of more-than-human agencies and collaborative intra-actions. In contrast to the multispecies community in *Salt Fish Girl*, the all-female Grist community does not need bioengineered durian trees for reproduction since “Grandma Chang invented the partho pop” (Lai 2018, 20). Parthenogenesis secures the survival of the community as long as it has “doublers,” sisters capable of reproduction, and “starfish,” sisters who can regrow organs that the respective “grooms” transplant to the doublers’ bodies. Medical training and knowledge as well as the cultivation and use of “forget-me-do,” which “makes you feel pain as pleasure,” secures the success of this complex medical procedure called “sexy suture” (21). This medical practice and approach to communal living and dying thus point to an alternative to the paradigm of individuality and growth inscribed in the DNA of Western societies through grand narratives.

Although, as Klimenko (2021) points out, Grist Village does not symbolize a utopian counter-space because the Grist sisters’ model of care and

of communal living relies on exclusive impulses and purity discourse, the community opens up alternatives to capitalist and colonialist practices. Both their language and their religious belief allude to a self-understanding that differs from the anthropocentric privileging of the mind over the body. The Grist sisters do not introduce binaries in order to try to separate themselves from the ecological system they rely on for their survival and medical practice. Instead of attempting to separate culture from nature or from science,⁷ they embed knowledge in quotidian practices which rely on intra-community and inter-generational intra-actions. Such practices tie in with Jasanoff's idea of co-production in a closed off community: "co-production is shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it" (2010, 2–3).

The Grist sisters' knowledge systems and preservation also contrast the reliance on technological storage devices in Saltwater Flats. Since they safeguard knowledge through oral transmission and embodied knowledge, they have to be "extra smart" (Lai 2018, 19). Such epistemological concerns are also linked to the knowledge of origins—while Wai claims that "[Kora] needs memory scales to understand the world that was" (29), Kora is left ignorant of her family's past or her relation to the Grist sisters until she is sent to the Cordova Dancing School. Kirilow, in turn, is familiar with her genealogy and eager to hold what "remains of the old world's knowledge in [her] raw brain" (20).

When Kora and Kirilow meet in the Cordova Dancing School, the Grist sisters' knowledge and community is almost lost. Due to the death of the community's presumably last doubler, when Kirilow refuses to transplant the starfish Peristrophe Halliana's—her lover's—heart, the Grist community already is on the brink of total destruction when an infected "Salty" enters the village to ask Kirilow for help (Lai 2018, 46). Peristrophe, the last, "overharvested" starfish (Klimenko 2021, 166), dies of the tiger flu shortly afterwards. HöST's ensuing attack on the village and murder of all but a few Grist sisters thus threatens to eradicate the whole cordoned-off (epistemic) community. Kirilow does not know anything about the world beyond the boundaries of the village, but her endeavour to find a new starfish is eventually successful when she meets Kora at the Cordova Dancing

7 In contrast to Western societies, the Grist sisters hence do not abide by the construct of what Latour has called the Great Divides between Nature and Society, Human and Non-human and Us Westerners and Them Others, which are the results of modernity's processes of simplifying purification, according to him. For a further critique of these binary divisions, see Latour (1993); Haraway (2008).

School. This school is a former Grist commune located at the margins of Saltwater Flats, and it figures as a space between Saltwater City and Grist Village and their respective knowledge systems. As one of the Cordova girls states, “In order to survive in the world that is coming, we need to know our history. [...] Knowledge, my sisters, is the most important tool we have. [...] Technologies come and technologies go. So we must make use of everything we’ve got” (Lai 2018, 86). Here, Kirilow does not only find a new starfish in Kora, who proves to be a relative of the Grist sisters, but also learns to make use of different forms of medical practice and to overcome purity discourses.

When Kora is lethally wounded towards the end of the narrative, her consciousness has to be uploaded to a Batterkite, an airship engineered by Isabelle Chow “from seal bladder and oyster material” (Lai 2018, 91). This embrace of a technological-natural vessel eventually enables the creation of a new Grist community, when Kora and Kirilow notice that the “tentacles of the kite doctored carefully and left to lie long enough atop fertile soil could become roots” (328), from which a tree grows. The last chapter of the novel is set in New Grist Village in the year 2301, or 269 TAO, and Kora has become the Kora Tree, from which organs can be plucked. Despite the split of Kora’s mind from her dying human body, her consciousness is more embedded in the material world than before. She thus becomes an embodiment of the community’s decolonization through reproductive agency and continuous intra-active knowing. The utopian idea offered in this last chapter “demonstrates the kind of long-term reciprocity instrumental to” sympoiesis (Klimenko 2021, 175). As an epistemic culture, New Grist Village is based on entanglement, becoming-with, and knowing as material practice and intra-action of differential agents. As Braidotti emphasizes, for “the subject to be materially embedded means to take distance from abstract universalism” (2019, 11–12), which has characterized anthropocentric thought and established knowledge practices since the time of Enlightenment. The rhizomatic community relies on the Kora Tree in many ways—not only does she provide organs, she also “vibrates language” (Lai 2018, 327) and teaches the young Grist sisters their history, reminding them of their entanglement: “You and me—we are alike. We fruit!” (326).

Conclusion

This article has discussed how, in the dystopian futures envisioned by Larissa Lai’s *The Tiger Flu* and *Salt Fish Girl*, knowledge is not presented as an objective set of facts produced by ‘Science’ and acquired through passive reception, independent of worldviews, thought-structures, and a person’s ontological status, class, and ethnicity. Lai’s novels target anthropocentric knowledge-making practices indebted to biocolonialist and capitalist patterns of thought and action. Rendering visible the practical implications of the discursive construction of many human beings as ‘Other’ and of the more-than-human world as passive matter, the dystopian aspects of the narratives showcase how

[k]nowledge and its material embodiments are at once products of social work and constitutive of forms of social life [...]. Scientific knowledge [as well as technology] is not a transcendent mirror of reality. It both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions. (Jasanoff 2010, 2–3)


Despite their bleak settings, Lai’s speculative fiction narratives neither give in to despair nor hail ecomodernist belief in technology. As Klimenko argues, *The Tiger Flu* particularly “speculates on what a more inclusive society can be” (2020, 164) after the dissolution of exploitative knowledge-making practices. As utopian thought experiments, Lai’s wildly creative novels envision an ethics of inclusive knowing to allow for reflections on new ways of knowing oneself and ‘the Other’ through non-anthropocentric epistemologies. When Lai foregrounds ideas of knowing as material practice and of knowledge as embedded and embodied, her stories point to possible re(al)locations of agency.

In this regard, the novels’ rejection of the “mental habit of universalism is a way of acknowledging the partial nature of visions of the human that were produced by European culture in its hegemonic, imperial and Enlightenment-driven mode” (Braidotti 2019, 12). Their critique via the dystopian principle of extrapolation can thus be understood in relation to how “Global South epistemologies and philosophies of race and racism [...] have long anticipated the ways to differentially imagine knowledge and perception as the foundation of planetary inheritance” (Gómez Barris, quoted in Alaimo 2020, 184).

Salt Fish Girl and, even more so, *The Tiger Flu* reveal hierarchical differences established by imperial thought that result in the literal consumption of ‘the Other.’ The juxtaposition of dystopian exploitative

knowledge-making practices and utopian collaborative knowing constitutes a potential form of activism against anthropocentric and biocolonialist exploitation in the alleged service of science. Lai's speculative fiction narratives thus sow the seeds of alternative epistemologies that can sprout urgently needed (utopian) forms of re-worlding by envisioning possibilities for an ethics of inclusive knowing as sympoietic practice.

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Specious Species Taxonomies: Porosity and Interspecies Constellations in Nalo Hopkinson's *Midnight Robber*

ABSTRACT Nalo Hopkinson's Afrofuturist novel *Midnight Robber* (2000) is a stellar example of postcolonial science narratives which imagine kinship connections between human and non-human characters and entities. Ties that develop between species in tandem with the novel's cyborg characters showcase the porosity of species boundaries, entangling interspecies connections within a frame of Afrofuturist porosity. Moreover, *Midnight Robber* uses non-human species as a foil to explore colonial legacies and ties the negotiation of species taxonomies to postcolonial criticism and Afrofuturism. As a postcolonial *Bildungsroman*, *Midnight Robber* triangulates narrative strategies, Afrofuturism, and interspecies relations by renegotiating modes of sociality in order to reconsider violent implications of science and how they can be undone. Bringing into dialog Afrofuturist, postcolonial, interspecies, and literary studies, this chapter aims to explore how Hopkinson's novel uses the genre of the *Bildungsroman* and sutures together Afrofuturism, porosity, and interspecies kinship in search of a more egalitarian future.

KEYWORDS Afrofuturism, interspecies kinship, porosity, postcolonial speculative fiction

[W]e are Homo Narrans,
both bios and mythos.
(Jackson 2020, 34)

Introduction: Dialog between Porosity and Interspecies Theory

Communities tend to organize themselves by means of boundaries—territorially, communities use boundaries to sketch their turf; conceptually, they define their sense of self through inclusion within and exclusion outside of boundaries.¹ Such boundaries can easily become normative and dogmatic. For a long time, both postcolonial literatures and theory have focused on the construction and effects of boundaries, which for the most part build on binary oppositions, and on how they can be deconstructed, exposed as spurious endeavors to maintain certain hierarchies. In this context, the concept of porosity has recently gained traction. Interpreting literary narratives, Mark Stein focuses on “porous texts” (2017) and presents a useful and systematic definition of porosity:

[T]he presumed border between the texts we read, the cultures we breathe, and the effects we wield, the difference we seek to make in the world—politically, socially, interpersonally, ecologically, historically,—is marked by *porosity*: By leakage, seepage, organic, vital exchange, breathing pores, connection, intersection, transference, and transgression. (140–41, emphasis in original).

In keeping with this definition, porosity has become a key term for many kinds of connectivity. It emphasizes that, whenever exchange across allegedly bounded systems is possible, this potential for porosity is actually *immanent* to such systems, and their boundaries are unstable and permeable.

Stein’s definition highlights such permeability, the messy, the material, and the fleshy. Interestingly, it thus adumbrates what is increasingly picked up in a major strand of the environmental humanities, i.e., interspecies scholarship, for instance in one of the major contributions to the field: Donna Haraway’s *Staying with the Trouble* (2016). Haraway’s study is

1 I would like to thank the editors for including me in this project. A special thank you goes to the anonymous reviewers and Eva Ulrike Pirker and Birgit Neumann in particular for their feedback on earlier versions of this article.

a rallying cry for “oddkin” (2). She exhorts her readers: “The task is to become capable, with each other in all of our bumptious kinds, of response. [...] The task is to make kin in lines of inventive connection as a practice of learning to live and die well with each other in a thick present” (1). The notion of a “thick present,” constituted by its entanglement with past and future times and characterized by a multiplicity of interspecies relations, is indubitably motivated by a twenty-first century that is witnessing climate change and environmental destruction of unprecedented extents. Haraway demands that humans abandon the privileges of anthropocentrism and make kin beyond what I call specious species taxonomies to ensure the wellbeing of the planet and its many inhabitants.

The ways human communities sketch themselves in contrast to other humans as well as other species are a form of narrative, as this chapter’s initial quote suggests. Science fiction testifies to strong ties between narrative and science and lends itself particularly well to creatively imagining paradigms and communities which expose the porosity of communal boundaries in general and, which is especially relevant for our purposes, “alterity, subjectivity and the limits of the human” (Vint 2010, 2). My contribution explores how interspecies connections, as they are imagined and narrated in Nalo Hopkinson’s novel *Midnight Robber* (2000), relate to and expand porosity, linking it to Afrofuturist endeavors, and how the novel renegotiates certain products and discourses of science by these means. The acclaimed novel is a stellar example of postcolonial science narratives which thematize interspecies constellations and display porosity in form and content, particularly because the genre of the *Bildungsroman* allows the narrative to reflect on social dynamics and political implications behind character formation (Who is a character? Who is a person?). Set in outer space, *Midnight Robber* imagines life in an extraterrestrial postcolony on the fictional planet Toussaint, which bears strong resemblances to the Caribbean, as well as on Toussaint’s prison planet New Half-Way Tree. Braiding together multiple storylines, the novel relates how the protagonist, a girl named Tan-Tan, grows up, is abducted, and repeatedly raped by her father, who takes her to New Half-Way Tree. There, Tan-Tan befriends another species, the douen. *Midnight Robber* imagines interspecies connections between “humans and other animals” (Wolfe 2013) and between humans and digital entities. The entanglements of the human and the non-human powerfully deconstruct the otherness of the non-human, incorporating interspecies constellations within the frame of porosity. The novel’s cyborg characters, in tandem with ties that develop between species, showcase the porosity of boundaries between forms of being. Thus, the novel revises anthropocentrism and the science backing it up from a

postcolonial perspective and traces confluences between Afrofuturism and interspecies porosity.

In the remainder of this article, I focus on three pillars of Afrofuturism in Hopkinson's novel, following Mark Dery (1994) and Ytasha Womack (2013) in their definitions of Afrofuturism: Firstly, I engage with cyborgs as Afrofuturist oddkin and narration in *Midnight Robber*, concentrating on technology as a pivotal element of Afrofuturism. Then, the analysis delves into interspecies contact, pointing to the extratextual dehumanization of Black people (Jackson 2020) and consequent glitches in definitions of personhood, which connect to the novel's reflections on 'other' species through characters' encounters with difference (Ahmed 2000). Lastly, I analyze interspecies transformation as Afrofuturism, engaging with narratives of formation as part of the porous poetics performing this (trans)formation (Slaughter 2007; Stein 2004), not least with an eye to kinship relations (Haraway 2016) in the novel. The concluding subchapter reflects on the implications of *Midnight Robber* for science fiction and discourses of science, taking into account the novel's use of African epistemology in this context (Osei 2023) and engaging critically with the relative transformative thrust of anthropomorphic species and regulative social structures in the novel.

Cyborgs as Afrofuturist Oddkin and Porous Narration

According to Dery, the concept of 'Afrofuturism' covers "[s]peculative fiction that treats African-American themes and addresses African-American concerns in the context of twentieth-century technoculture" (1994, 180). Despite its breadth, the definition is silent on contributions from other African and African-descended groups and diasporas. Also, as we have long since entered a new millennium, it only makes sense to widen the time frame. More recent definitions hold that Afrofuturist movements free African, African diasporic, and Black imaginations and creative works from the tethers of the past and enable them to envision and to inhabit a future, contributing to decolonization by daring to look ahead (Womack 2013, 9). To go with Womack, "Afrofuturism combines elements of science fiction, historical fiction, speculative fiction, fantasy, Afrocentricity, and magic realism with non-Western beliefs" (9). In this context, technology is an important factor and, by corollary, a recurrent trope in Afrofuturist works: Technology is an advanced and highly valued product of science. Since technology was and "is too often brought to bear on black bodies" (Dery 1994, 180), it is profoundly Afrofuturist to reclaim it for Black

subjects.² In the hands of Black, African, or African-diasporic artists and characters, technology is pliable and useful: On the one hand, their acts of reclaiming technology are attempts to strike back at forms of oppression of their communities and ancestors through technology. On the other hand, Afrofuturist uses and depictions of technology strongly counter anti-Black or anti-African stereotypes by imaginatively promoting Black cultures to the very forefront of progress.³

By way of putting technology center stage, *Midnight Robber* clearly meets a central criterion of Afrofuturist works. For instance, eshus are a potent example of Afrofuturist elements in the novel: “Also known in Caribbean and West African cultures as Esu, Elegba, Legba, or Eleggua, Eshu is the Yoruba trickster deity, the deliverer of messages to and from the spirit world in West African religions who can be in all places at once” (Enteen 2007, 273). Furthermore, Eshu is considered “the god of mischief” (Kanu 2018, 122), a “trickster figure [who] is the protector of travelers and frequently plays games that enable individuals to gain a new understanding of the world” (Knepper 2013, 143). In *Midnight Robber*, an ‘eshu’ is an artificial intelligence which helps people on Toussaint navigate their daily lives. Decapitalized, these eshus signify both traditional past and technologically advanced future and overcome the dialectic of the two.⁴

2 One might be inclined to think that oppression and discrimination through technology are a thing of the past. Regrettably, this is not the case. To name but one example, most ordinary cameras and face-recognition systems favor white skin and faces and, therefore, may not recognize a Black face as human or adequately photograph Black people (Cole 2015). Moreover, the last couple of years have brought forth surveillance technologies that enable racial profiling, further singling out non-white people and racializing criminality. Then again, said surveillance technologies technically could be used to monitor and prosecute discrimination and violence against Black people—video footage of George Floyd has played a big part in documenting his killing and in setting the narrative right. Lamentably, such pro-Black use of technology for the most part still has a rather Afrofuturist ring to it, not least with an eye on AI and its reproduction of racist bias.

3 It is imperative to take into account that notions of ‘progress’ are tied to a “prevaling Western/Eurocentric framework” (Pirker, Hericks, and Mbali 2020, 2). In this context, achievement implies “to move forward, to move on or to move up in life” (2). It might be fruitful to explore how different Afrofuturist works negotiate this tension.

4 Several scholars expand further on Afrofuturist elements in *Midnight Robber*. See, for instance, Martín-Lucas (2017). Erin Fehskens puts forth a slightly different, equally intriguing and related interpretation, saying that the novel “creolizes cyberpunk and Caribbean genealogies of resistance” (2010, 137).

Beyond directing the focus towards technology and a past–future continuum, these Afrofuturist eshus furthermore reinvigorate technology and contest the status of the human as bounded, individual, and self-reliant: The humans on Toussaint can have technology inserted into their very bodies and are thus linked to the supervisor web Granny Nanny. Many of them have an “earbug” (Hopkinson 2000, 5), to which they can issue commands, and they can have their own eshu, an artificial intelligence with which to communicate, from which to learn, and on which to rely (5). Eshus can be both inside and outside of the human body (5), which calls into question parameters of (im-)permeability, visibility, and materiality. On these grounds, several scholars have read the inhabitants of Toussaint as cyborgs (Thaler 2010, 109; Martín-Lucas 2017, 107; and others). To evoke Haraway’s famous definition, “[a] cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction” (1985, 65).⁵ Yet, as alluring as it sounds, the cyborg concept does not sit well with Blackness, as Therí Pickens insists:

Since the cyborg opens up the conversation about futurity—which usually elides madness and Blackness—it also becomes a useful space to consider who we are becoming. Certainly, to think through our kinship with machines is apropos for discussions of disability given the medicalization of certain bodies [...] But the cyborg is an incomplete, politically fraught, and ethically suspicious answer to a series of questions about *raced and disabled* futurity. (2019, 19, emphasis added)

So, as an alternative reading more sensitive to uneasy tensions between Black experience and cyborg theory, I propose that it is worthwhile to consider the permeation of human bodies with technology in *Midnight Robber* as closely related to the cross-species and interspecies relations made possible by science that are configured in the novel. Earbugs and “nanomites” (Hopkinson 2000, 328), in this sense, would be like Haraway’s “critter[s]” (2016, 61): tiny organisms which populate the human body, sustain its metabolism, and thus contest the notion of an isolated human ontology and ecosystem. By reconfiguring the human in this way, *Midnight*

5 As a matter of fact, the cyborg may not even be as futuristic as it sounds, depending on how one reads it. In their excellent treatise *Animacies*, Mel Chen (2012) stresses: “Human bodies, those preeminent containers of life, are themselves pervaded by xenobiotic substances and nanotechnologies” (193), which proves the porosity of the non-fictional human body for more-than-human entities and substances.

Robber labors to undo the binary of organic and digital being and to make science visceral, embodied matter.

Future-oriented as the novel is, it has in mind an even further-reaching future, characterized by unprecedented entanglements between humans and technology. The body of Tan-Tan's as-yet-unborn son, who is addressed by the narrator at the end of the novel, "**is one living connection with the Grande Anansi Nanotech Interface. [...] Flesh people talk say how earbugs give them a sixth sense, but really is only a crutch, oui? [...] You now; you really have that extra limb**" (328).⁶ From this it follows that the next generation will not only be aided by technology but has an even deeper connection to it: technology and the human can no longer be disentangled. This successfully undoes the dyad of human and non-human. The human species is unveiled as not closed off against other lifeforms but very much dependent on and open to, porous for, them.

Narration in *Midnight Robber* performs both porosity and Afrofuturism, all the while being tied to negotiations of interspecies relations. The narratives of *Midnight Robber* are porous, as they straddle textual boundaries through many storylines, self-referential intertextuality, intermedial configurations, and circular narration. Hopkinson's novel is made up of several narrative strands, which form a complex web of storylines and multiple truths. Some parts, printed in bold, can be attributed to an organizing narrative authority, who interrupts the main plot of Tan-Tan to address her and communicate their own opinion. Also printed in bold are minor tales of Tan-Tan, which sometimes chime and sometimes clash with what the main storyline reveals. What all narratives in *Midnight Robber* share is an emphasis on the interventions of the narrator, who has qualities of a "**griot**" (79). The griot, an "*African storyteller*," is "*the main conveyor of the collective wisdom*" in African storytelling (Henrich 2001, 24; emphasis in original). Culturally specified, the griot-like narrative techniques employed in *Midnight Robber* infuse the generic conventions of the novel as a written medium with elements of oral storytelling, thus straddling boundaries between modes of narration and adding traditional African elements of storytelling to the porous, Afrofuturist narrative.⁷

6 I reproduce bold print used in *Midnight Robber* in order to stay as close as possible to the workings of the text and its materiality. Bold print in the novel variously visualizes artificial intelligences or non-human creatures speaking and thus highlights non-human speech and non-human presences in the narrative.

7 Another significant level on which *Midnight Robber* qualifies as a porous narrative is language (cf. Doloughan 2016, 143). English is creolized and comes into contact with a number of Creole languages on diverse diegetic levels:

Interspecies Contact and Afrofuturism

The significance of technological gadgets and intelligences which *Midnight Robber* underscores notwithstanding, Black futures can be imagined in ways that surpass emphasis on technology. Black subjects' humanity has been questioned over large periods of time (Jackson 2020, 1). Enslavement and colonization dehumanized Black people structurally, and police brutality against Black people, the Black Lives Matter protests gaining visibility and popularity since 2020, as well as the events that sparked them prove the dire truth that Black and non-Black people alike still need to fight for Black humanity to be recognized. Importantly, "the categories of 'race' and 'species' have coevolved and are actually *mutually reinforcing terms*" (12, emphasis in original). As the subjugation of Black people was rationalized through discourses which equated them with animals, to claim recognition for non-humans is a delicate issue when it comes to those humans whose own personhood remains cruelly contested. Critical scholar Zakiyyah Jackson strives to "identify [...] our shared being with the non-human without suggesting that some members of humanity bear the burden of 'the animal [...]'" (12). I argue that this can be a crucial frontier with an Afrofuturist purchase, as it leaves behind the struggle of Black people to be acknowledged as humans and moves so far beyond it that it can explore interspecies relations as a completely new nexus of Afrofuturist thinking.

Simultaneously, porosity in *Midnight Robber* reaches its full potential when harnessed to deconstruct species taxonomies. Such deconstruction is achieved by how the novel reimagines evolution and narrates bonds that exemplify kinship beyond species boundaries. Let us begin with the novel's rewriting of evolution: At the beginning of the novel, Tan-Tan's father kills his wife's lover and flees to the prison planet New Half-Way Tree, sequestering his daughter. Tan-Tan's transdimensional journey from Toussaint to New Half-Way Tree breaks up boundaries between several organic species (cf. Hopkinson 2000, 74). As Tan-Tan is being cast through dimensions on her journey from one planet to the other, chasms and boundaries between species—human and 'other'—dissolve. Tan-Tan undergoes a sort of micro-evolution, whose starting point deposes the human from their self-assigned throne. Once Tan-Tan and Antonio reach New Half-Way Tree, both of them are recognizably human again. What remains,

Code-switching by characters and the narrator as well as the role of nanny-song, the Creole language of the digital web Granny Nanny, which almost all inhabitants of Toussaint are connected to, testify to the postcolonial porosity of language in the novel.

though, is the knowledge that being human is a matter of perception and context. Crucially, the species with whom Tan-Tan briefly identifies stand in for various cultures and their respective histories: “Hopkinson evokes a cross-species Caribbean imaginary, which brings together manicou (a native of the Caribbean) and the mongoose (brought to the region through empire)” (Knepper 2013, 145). This fluid evolution, which is attentive to colonial history and its impact on ecologies, testifies to the links between Afrofuturist and interspecies conceptions and serves as a foil for more fleshed-out forms of kinship beyond species boundaries, taking up science on species development in its stride.

Midnight Robber further exposes species taxonomies as specious and boundaries between species as porous through its depiction of the relation between humans and douen. Douen are a bird-like species with roots in Caribbean folklore and are native inhabitants of New Half-Way Tree. The way they are depicted in the novel grapples with overlaps between the human as a species and personhood as a philosophical and ethical concept. As *Midnight Robber* shows, the ontological category ‘human’ is not coextensive with ‘person.’ When Tan-Tan and Antonio land on New Half-Way Tree, they are met by Chichibud, a douen. What follows is a “strange encounter,” an encounter with otherness (Ahmed 2000, 39). Tan-Tan’s first impression is relayed in detail: “The creature was only about as tall as she. It smelt like leaves. Its head was shaped funny; long and narrow like a bird’s. It was ugly for so! Its eyes were on either side of its head, not in front of its face like people eyes” (Hopkinson 2000, 92). Narrated from Tan-Tan’s viewpoint, the description casts Chichibud as an inferior other, reproducing well-worn tropes of non-human aliens.⁸ *Midnight Robber* goes on to contest those tropes. Comparing the creature to what she sees as the norm to measure everything else against, i.e., humans, Tan-Tan as a child is at least more curious than her father, who immediately calls Chichibud a “beast” (92). Chichibud’s answer is poignant: “Beast that could talk and know its own mind. Oonuh tallpeople quick to name what is people and what is beast” (92). He immediately expounds the Eurocentric and human-made dualism between humans and animals. Moreover, by calling humans ‘tallpeople,’ Chichibud adds a qualifier to ‘people,’ further undermining the status of the human as ontological given. By inference, he could be

8 Scholarship, too, posits the douen as irremediably Other. Langer, for instance, calls them “sentient aliens” (2011, 65)—which they are, as a matter of fact. Yet, I maintain that what *Midnight Robber* shows is that the ‘aliens’—a laden term—are persons and close to humans (whether the latter is worth aspiring to is a different question).

‘smallpeople,’ a form of people. Hence, Chichibud here “gives voice to a posthuman critique of the anthropocentric humanist obsession with hierarchical taxonomy” (Martín-Lucas 2017, 111; see also Sorensen 2014, 278).

Affirming that some animals do meet (Western) criteria of personhood, Derrida maintains that the key question for determining personhood is whether a given animal is capable of *responding* (2008, 8). Responses exceed reactions and imply sentience on the part of the responding one.⁹ Chichibud’s response to Antonio is a clever riposte; he meets anthropocentric expectations. Furthermore, Chichibud is polyglot: Apart from douen language(s), he also speaks several human languages: “Anglopatwa, Franco-patwa, Hispanopatwa, and Papiamento. [...] We learn all oonuh speech, for oonuh don’t learn we own” (Hopkinson 2000, 95). Matter-of-factly enumerating languages from the Creole continuum he speaks, Chichibud underscores that human arrogance is a reason why his species has had to learn several languages and that douen are more than capable of mastering human languages. When humans demarcate personhood, they elevate “the gatekeeper function of speech” (Wolfe 2013, 8). Chichibud’s command of a multiplicity of languages proves that he meets another, admittedly normative, criterion for personhood.

Midnight Robber further stages a confluence between postcolonial and interspecies discourses by portraying douen as similar to human colonial subjects. The relationship between human settlers and indigenous beings in the novel echoes how European colonizers violently displaced and subjugated non-European, Indigenous peoples. For example, this shows in the fact that the douen carry the burden of translation and need to learn a multiplicity of human languages. Descendants of slaves and the colonized themselves, those humans who now live on Toussaint follow the same patterns as European colonizers on Earth: They have subjected native inhabitants to their rule and now use them for their own purposes. Crucially, like historical colonizers on planet Earth, the settlers on Toussaint and New Half-Way Tree question the ‘personhood,’ i.e., the right to life and self-determination, of the creatures they encountered. Binary victim–perpetrator distinctions no longer hold—paradoxically, it comes down to a

9 To talk about ‘response’ entails questions of responsibility. Heiner Bielefeldt has made an interesting contribution on politics of responsibility in ecocritical and interspecies studies: Although many other pillars of anthropocentrism are toppled by scholarly and creative engagements with anthropocentrism, responsibility is more often than not still solely ascribed to the human (cf. 2021, 524). As it would exceed the scope of this paper to engage with Bielefeldt’s argument in depth here, I take it up later in my analysis of obstacles in the interspecies relationships woven in *Midnight Robber*.

non-human intelligence informing Tan-Tan about colonial history, which is ironic considering how most humans treat non-humans in the novel.

The fact that, despite their alleged superiority, humans here rely on the non-human for information and labor, among other things, lends a deeply ambiguous undertone to questions of morality and interspecies entanglements.¹⁰ Jessica Langer offers a convincing interpretation: *Midnight Robber* promotes “a non-essentialist view, and one that turns out to be explicitly anti-racist: descendants of colonized people are not valorized or idealized, but are rather portrayed as potentially colonial” (2011, 66). Langer sees Hopkinson’s novel as de-essentializing African-diasporic subjects, freeing them from their historically fixed position as victims. This Afrofuturist agenda is enriched by its outreach across species boundaries: Contemporary fields of research, “particularly animal studies, are slowly advancing the thesis that human–animal binarism is the original and foundational paradigm upon which discourses of human difference, including, or even especially, racialization was erected” (Jackson 2020, 12). Following this line of argumentation, Afrofuturism might not always stop at undoing narratives of Black victimhood on an intraspecies level but would sometimes reach out to other species. Daring to submit the coveted category of the human subject to intense scrutiny from interspecies-conscious angles, *Midnight Robber* contributes to redefining parameters of Afrofuturism, highlighting that both Afrofuturism and interspecies kinship are profoundly porous.

Afrofuturist Interspecies Transformation

Thus incorporated into the novel’s Afrofuturist set-up, interspecies entanglements develop significantly in the course of *Midnight Robber*. Specifically, one can trace character formation, a kind of *Bildung*, in the relation between Tan-Tan and the douen. Tan-Tan does not become an integral part of the douen community. Still, some ties do develop between the species. Subject formation in the genre of the *Bildungsroman* usually aims for integration of the subject into a community. Frequently, the task to change in order to be fit for integration was traditionally assigned only to the subject in formation (Slaughter 2007, 101). Plumbing a different field

10 As Langer puts it: “In *Midnight Robber*, the slave narrative has not been erased but rather displaced—the genocide on to the bodies of Toussaint’s douen and other life forms, and the slavery on to the people sent to New Half-Way Tree” (2011, 67, emphasis in original).

of African-diasporic and Black literatures—Black British literatures—Stein identifies a special kind of novel of formation: According to Stein, the “novel of transformation [...] is about the *formation* of its protagonists—but, importantly, it is also about the *transformation* of [a given] society and cultural institutions” (2004, xiii, emphasis in original). Following his definition, *Midnight Robber* can be interpreted as a novel of Afrofuturist interspecies transformation: It displays typical features of novels of formation but also transmogrifies the genre by adding elements of a postcolonial science narrative, performing porosity on the level of form and showing that both Tan-Tan and the douen have to adapt to build a relationship.

At the beginning, differences between Tan-Tan and douen appear insurmountable. When Tan-Tan and Chichibud meet for the first time, she is still heavily influenced by her father. When Antonio and Chichibud fight, Tan-Tan sides with her father and silently calls Chichibud a “nasty leggo-beast” (Hopkinson 2000, 99). Yet, after Chichibud has protected Tan-Tan and her father from a mako jumbie, a tall bird-like creature that attacks Chichibud and the humans on their way to a douen settlement, Tan-Tan places her trust in him: “Yesterday his snarly, snouty grin would have frightened her, but she was coming to like how his face looked” (117). Although Tan-Tan continues to notice Chichibud’s difference, she quickly becomes accepting of it and is willing to reconsider her parameters of identity and alterity.

Tan-Tan’s anthropocentric standards are further interrogated through “an ongoing dialogue about the categorization of species, sexual development, and gender that challenges prevailing communal discourses of identity” in *Midnight Robber* (Knepper 2013, 146). One powerful piece of evidence is how the sex of douen manifests and the confusion this causes for Tan-Tan, who, when she first sees young douen, observes: “Douen pickney could fly! The other kind of ratbat must have been packbird young. Their feathers were disorderly, rampfled up like slept-on hair” (179). Female and male douen look so different that she thinks they are distinct species altogether. Shortly afterwards, Tan-Tan learns that Benta, whom she has always taken to be Chichibud’s packbird, is actually his wife (cf. 181). Tan-Tan is confused because she generally bases species distinctions on sameness and difference, expecting sameness within one species. Chichibud retorts: “Allyou woman does look like man, or pickney” (182). Mocking the sameness of all humans, he turns the tables and posits his species’ appearances as the norm. Confronted with this knowledge, Tan-Tan begins to recognize “how the fronds of [Benta’s] feathers resembled the long hair on the douen pickney-them” (182). Once she has learned to look beyond patterns instilled into her by her upbringing, she can acknowledge

intraspecies dimorphism, which is all the more significant because male douen resemble humans much more than female douen do. In this regard, “[c]ross-dressing and the carnivalesque as well as encounters with non-human subjects” (Knepper 2013, 141) in *Midnight Robber* re-evaluate human-made and Eurocentrically oriented distinctions between sexes and genders *in tandem with* distinctions between species, adding nuance to biological discourses.

Tan Tan’s transformation can also be measured with regard to the level of respect she has for the douen. Growing up on New Half-Way Tree, Tan-Tan is partly influenced by other humans’ attitudes. (Male) human adults regard the douen as—at best—second-class citizens (cf. Hopkinson 2000, 120). Yet Tan-Tan becomes friends with Chichibud over the years. Chichibud reaches out across species boundaries in order to save her, offering her refuge among the douen when Tan-Tan is raped by Antonio and kills him in an act of self-defense on her sixteenth birthday (169). Since humans are going to prosecute Tan-Tan for Antonio’s death, Chichibud puts his own species’ community at risk to hide Tan-Tan (cf. 173). Here, “interspecies hostility [...] is bridged in the act of hospitality” (Martín-Lucas 2017, 111).

Despite the douen’s generosity, Tan-Tan is not integrated easily into the douen community. She is disgruntled with life in the bush, deprived of the relative amenities she is used to. Also, she is a young adult who just has had to live through a deeply traumatizing event. Altercations between her and douen are frequent. On the other side of the species boundary, not all douen are equally accepting of Tan-Tan having been given shelter in the douen community. One male douen in particular takes offense at Tan-Tan being there. Right when she arrives in the douen’s village, this douen uses a very obscene gesture to express his discontent, urinating with such force that his urine almost hits Tan-Tan (cf. Hopkinson 2000, 180). In order to avoid the pitfalls of what Bielefeldt denominates the “*anthropocentrism of responsibility*” and come to a balanced analysis of the relationship between species in *Midnight Robber*, the douen’s hostile behavior needs to be taken into account, too (2021, 524, emphasis in original). Problems in the relationships between Tan-Tan and the douen finally reach their climax because Tan-Tan does not obey the douen. She is advised to stay away from human villages to avoid capture. Keen on human contact, Tan-Tan ventures out into such villages anyway. One day, humans follow her back to the tree in which the douen live. When humans and douen meet, a violent confrontation takes place. One human shoots Taya, the sister of Chichibud’s wife Benta. In graphic detail, the narrator describes the spot “where Taya’s severed head was lying, the beak still opening and shutting; reflex action as her brain died” (Hopkinson 2000, 270). Thus depicted,

Taya's death affectively symbolizes consequences of human intervention and seems to refute the possibility of Tan-Tan's integration into the douen's community. Consequently, Tan-Tan and Abitefa, Chichibud's daughter who has helped her sneak into human settlements, are expelled from the douen community.

Prior to this infelicitous outcome, both Tan-Tan and her relationship with the douen had begun to change. In terms of sex, gender, and age, Tan-Tan and Abitefa, Chichibud's daughter, are peers. They become co-developing mates. Among the douen, there is a rite of initiation for those who are not yet adults, which resonates with ritual markers of processes of (trans)formation or *Bildung*. Benta instructs Tan-Tan to stay with Abitefa during her initiation period (cf. Hopkinson 2000, 221). Hence, they come to form a "trans-species community of mutual support" and grow up together for some time (Martín-Lucas 2017, 112). Abitefa teaches Tan-Tan how to survive in the bush, which allows the human to "learn [...] to creolize human and douen methods of living" (Fehskens 2010, 146). In the format of the *Bildungsroman* and in the wider context of stories of initiation, mentor figures are often essential to the protagonist's *Bildung* (Freese 1998, 150, 155, 174), referring both to their education and to their formation. Mentor figures are considered to be more experienced and knowledgeable than the subject in formation because they already have undergone formation. As Abitefa knows to navigate the bush, she assumes the position of Tan-Tan's mentor. That Tan-Tan's mentor is from a different species diminishes anthropocentrism and affirms the potential of interspecies "becoming-with" (Haraway 2016, 12).

Moreover, Tan-Tan comes to adopt some of the douen's communal values. For instance, douen form bonds of kinship beyond their own species, and Tan-Tan learns to branch out to other species as kin, too. When Tan-Tan first arrives on the tree where the douen live, Chichibud declares: "You in a Papa Bois, the daddy tree that does feed we and give we shelter. Every douen nation have it own daddy tree" (Hopkinson 2000, 179). The affiliative connection between douen and their tree modeled after filial proximity even shows in the name, "daddy tree" (Anatol 2006, 118). After the conflict between douen and humans, the douen have to leave their home and fell their tree to hide from the humans. When they do so, the scene is profoundly saddening: "[One douen's] wail got louder. So a child would lament a dead parent. Other douens joined in, some chanting low and passionately [...], some screaming, ululating, crying" (277). The douen's pain over the loss of their kin elicits Tan-Tan's empathy. Additionally, Tan-Tan's reaction shows that she has come to accept the douen's community frames for what is "grievable" (Butler 2010, 15).

Judith Butler explains parameters of grieving and concludes “that there is no life and no death without a relation to some frame” (7). Such frames are highly regulative and determine whether a given existence is deemed so valuable that its cessation would be appropriately met with grief. This kind of existence, then, counts as a life. Importantly, Tan-Tan here bids the tree farewell: “Thanks. I so, so sorry. Thanks” (Hopkinson 2000, 277). Her participation in the collective act of mourning attests that her frame of what is a life has expanded considerably. Moreover, she addresses the tree, which suggests that she accords sentience, the capacity to hear and understand her, to the tree. Matter, for her, has come to matter; the more-than-human is no longer removed indefinitely.

Aware of some kind of *Bildung*, Thaler has called *Midnight Robber* “another female coming-of-age story” (2010, 102). While her analysis dedicatedly traces how Hopkinson’s novel oscillates between Caribbean history and a projective future, I want to deliberately spell out the significance of a novel of (trans)formation in the context of interspecies porosity: Initially, “the philosophy of *Bildung* [...] articulated a transitive grammar for the elevation of the bourgeois male citizen to the universal class” (Slaughter 2007, 92, emphasis in original). This lays the foundation for a “historical social role: incorporating the problematic individual into the rights and responsibilities of citizenship” (94). German in origin, formation as a concept “conceives of harmonious human personality development (*Bildung*) simultaneously as an *unfolding* of an individual’s latent humanity in its encounter with the structures of the social world and as an *enfolding* of the individual within and by those structures” (101, emphasis in original). Usually, *Bildung* is thus contingent on the anthropocentrism of humanist (scientific) discourse.

The predominant narrative of the *Bildungsroman* as the integration of an initially unsuitable human individual into an extant, likewise human, community has seen varying inflections over the centuries. Whereas character formation of this kind used to be ideologically tied to “the progressive harmonization of the individual and the state” (91), contemporary versions of the *Bildungsroman* do not always elevate the nation-state as much as they foreground different kinds of social formations. Furthermore, protagonists of novels of formation were traditionally male. The genre has long since been diversified to encompass female and postcolonial subjectivities, to name but two inflections (cf. Fraiman 1993; Lima 1993; Hoagland 2006). Evidently, the *Bildungsroman* as a genre is subject to constant change, adapting to an ever-changing world and its visions. Bearing in mind the past of African and African-diasporic communities and the inclination toward the future propelled by Afrofuturism, it becomes clear that the *Bildungsroman*

in *Midnight Robber* carries out important political work. Straddling boundary lines between species while being rooted in the African diaspora's past but simultaneously branching out into a future, the development of the novel's female human protagonist (with cyborg critters) invites us to read *Midnight Robber* as an Afrofuturist interspecies *Bildungsroman*.

Sketching future directions for literature from the African diaspora, Jackson holds:

African diasporic cultural production intervenes productively in reconsidering the role of 'the animal' or the 'animalistic' in the construction of 'the human' by producing nonbinaristic models of human-animal relations, advancing theories of trans-species interdependency, observing trans-species precarity, and hypothesizing cross-species relationality in a manner that preserves alterity while undermining the nonhuman and animality's abjection, an abjection that constantly rebounds on marginalized humans. (2020, 18)

It would be wrong to say that Hopkinson's novel envisions a utopian interspecies form of "being-with" (Nancy 2000, 3). Instead, *Midnight Robber* charts and, to stick with Jackson's wording, 'advances', 'observes' and 'hypothesizes' incipient transformation of specious species taxonomies. Tan-Tan's actions have damaged the douen community, as Benta's sister has died and the douen have had to abandon their daddy tree and move to a different place. Conceptually, this has not dissolved boundaries between species but, for some douen, solidified them, so the community of douen as a whole has not changed on an infrastructural level. However, Chichibud, Abitefa and Benta have come into close contact with Tan-Tan, Benta and Abitefa having become something akin to Tan-Tan's adoptive mother and sister, respectively (Crosby 2013, 194; see also Anatol 2006, 118). The bonds between them can be read as familial relations, which both attests their proximity and includes Tan-Tan in a micro-community among the douen. Tan-Tan herself has come a long way ever since her first encounter with Chichibud. The relationship between Tan-Tan and the douen is what makes it possible for Tan-Tan to overcome the abuse she has suffered at her father's hands (Anatol 2006, 117). Also, the relationship is not only beneficial for Tan-Tan but has also slightly changed how Tan-Tan approaches the douen: At least Tan-Tan comes to appreciate the douens' knowledge of the bush and recognizes their superiority in this space. Although she has not been integrated into the wider douen community, after minor and major altercations, the two species have established ways of being-with each other on an individual level. Accordingly, the straddling of boundaries has

been ‘initiated’; for members of both species, trans-formation (‘formation’ retaining echoes of the German *Bildung*, i.e., education and development) has begun.

Crucially, the underlying logic of all *Bildung* is circular: For someone to mature and to be integrated into a given social formation, they have to possess or to have attained something of what their formation is supposed to produce from the outset (Slaughter 2007, 137). That ties between Tan-Tan and the douen could spring up shows that there was a predisposition for this in the first place. In other words, boundary lines between the two species have always been porous. The *Bildungsroman* is heavily pluralized through transcultural travel and inflections in *Midnight Robber*. Imagining budding interspecies bonds between extraterrestrial non-humans and a Black, female human pervaded by technological beings as a form of *Bildung*, *Midnight Robber* transforms the genre and exposes it as being malleable and immanently porous.

Conclusion: The Afrofuturist Past in (Trans)Formation

What, then, is the relation between science and narrative in *Midnight Robber*? First, technology as one of the prime products of science pervades the communities depicted in the novel. *Midnight Robber* manages to liberate technology from its anti-Black heritage and to use it for the empowerment of a Black diaspora equipped with the most refined technology, which even blurs boundaries between the human and the non-human. Second, scientific discourse is also renegotiated critically in *Midnight Robber* with an eye to species taxonomies. Literary imaginings of human-like but non-human species deconstruct anthropocentrism and depose the human from their pedestal, especially since *Midnight Robber* is vocal about human violence. *Midnight Robber* negotiates otherness with regard to non-human species as part and parcel of the novel’s Afrofuturism. Weaving together Afrofuturism, criticism of colonial practice and legacies, and interspecies kinship, Hopkinson’s novel hammers home the point that oppression and discrimination of Black subjects, exploitation of non-human species, and technological and biological science are deeply intertwined. Narrative here offers an opportunity to excavate blind spots of science, and it uses the power of fiction to invoke sympathy for those at the receiving end of scientific violence, the *Bildungsroman* serving as a tool to question underlying social parameters.

This also contributes to the (trans)formation of science fiction. Ping Su and Adam Grydehøj hail *Midnight Robber* “as a milestone in decolonizing

the mainstream Western science fiction”, “interweav[ing] narrative science fiction with Caribbean history and culture” (2022, 685). This is particularly relevant seeing as science fiction itself, they argue, “has often maintained a colonial pattern, with domination and oppression looming large in the narrative” (685). In addition, Elizabeth Abena Osei emphasizes African roots of Caribbean cultures and African cultural repositories as part of the fabric of *Midnight Robber*: Mentioning “Afro-Caribbean folklore traditions and magic in imagined futuristic spaces” (2023, 2) as a hallmark of Nalo Hopkinson’s writing, Osei’s Afrofuturistic reading of the novel’s “reclamation of traditional African storytelling techniques” (2) teases out “analogies consistent with the Sankofa principle” (2). As “the Sankofa bird [...] realizes the importance of traditional cultural practices” (6), striving for a better future, Osei’s argument makes it possible to focus on an African epistemology at work in the Afrofuturist dynamics of *Midnight Robber*. This makes the novel a case of *African science fiction* “performing the philosophy of the return” (14) while looking into the imagined future.

Last but not least, narration in *Midnight Robber* itself triangulates science, Afrofuturism, and interspecies relations: As one of the final passages of the novel reveals, Tan-Tan’s eshu, whom she had to leave behind on her way to New Half-Way Tree, is the novel’s griot-narrator who has always kept an eye out for Tan-Tan. Rooted in African cultural heritages but imbuing them with futuristic elements, the Afrofuturist griot-narrator exercises narrative agency to straddle boundaries between species, cultures, pasts, and futures and marks their porosity once and for all.

Invigorating impulses which propound interspecies porosity in conjunction with Afrofuturism notwithstanding, interspecies transformation cannot be said to be completed in *Midnight Robber*. One has to admit that the douen are particularly well suited to affiliation with humans because they have many qualities that can either be found in or are understandable to human subjects: They can talk; their males walk upright, wear clothing, and know how to handle arms; they form settlements and families; and they grieve. As a species, they are comprehensible in and through human terms and only become known to the reader through a human-made label (Martín-Lucas 2017, 111).¹¹ The alleged other’s “right to opacity” (Glissant 1997, 190) is relative here: The douens’ opacity and difference are rather domesticated, and they largely work along human-made parameters, which is of course due to “[t]he anthropomorphic bias of narratives” (Fludernik 1996, 13). It seems fair to say that the *Bildungsroman*, the genre *par excellence*

11 To label them ‘anthropomorphized’ would perpetuate anthropocentrism.

for negotiating human modes of sociality, here displays a tendency toward reinforcing such anthropocentrism.

Furthermore, the ending of the novel re-ingrains the image of the human heterosexual nuclear family. In the final scene, Tan-Tan gives birth to her son, supported by Abitefa and her human boyfriend Melonhead (cf. Hopkinson 2000, 329). Melonhead standing in for and as a father figure glosses over the fact that Tan-Tan's own father has raped and impregnated her. Moreover, Abitefa is demoted to the status of midwife, *companion* but not equal to the human protagonists—she does not even speak in this scene. Her presence might pluralize the nuclear family narrative, but agency has not been redistributed too radically between the two species. Certainly, the fact that there are other truths lurking right under the surface of the final scene—a history of rape, affiliative gestures from Melonhead, and a complex interspecies relationship between Abitefa and Tan-Tan—pluralizes the normative image of the nuclear family from within and below.¹² Still, the nuclear family is a powerful and lasting image. LaMonda Horton Stallings, well-acquainted with gender and queer theory as well as Afrofuturism, might have called this a “heteropatriarchal recolonization that happens with [...] the Western model of family” (2015, 28). Porosity mainly resurfaces on the level of form, *Midnight Robber* ending on a final comment from the griot-narrator. Insinuating that this ending may be but one version of a fabulous story in a network of multiple truths—“*me nah choose none!*” (Hopkinson 2000, 329, emphasis in original)—the ending points, slightly feebly, to other possibilities.

These points of contention notwithstanding, *Midnight Robber* mobilizes the double meaning of *Bildung*—both Tan-Tan and the douen undergo formation, and the novel contributes to knowledge production as a postcolonial science narrative. In all its porosity, Hopkinson's novel showcases that there is an Afrofuturist purchase to trans-formative interspecies porosity. Afrofuturism in *Midnight Robber* opens up to interspecies relations, despite discursive, material, social, and economic dehumanization of Black communities, which has been going on for centuries. The deconstruction of specious species taxonomies does not stop at using non-human creatures as a metaphor for interracial kinship. Instead, it takes non-human life-forms seriously and offers species-straddling solidarity from a community

12 Crosby offers a more optimistic reading of the final scene. According to her, Abitefa here occupies the role of Tan-Tan's sister, who will help her raise the child (2013, 196). Though the extended family may be pluralized across species boundaries, neither the structural implications of Abitefa's silencing nor the pre-eminence of human heterosexual romance instantiate far-reaching transformation of both species.

that may have had a lot to lose by negotiating the human as a category. By projecting an Afrofuturist paradigm which has left behind the dire struggle for recognition of Black people as humans with equal rights, *Midnight Robber* uses the potential of postcolonial science narratives and ideates a radical Afrofuture invested in renegotiating the regulative parameters of anthropocentrism.

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Julia Wurr

Science and Biocapitalist Reproduction: Commercial Surrogacy in Joanne Ramos' *The Farm*

ABSTRACT By reimagining existing so-called surrogacy farms as a luxury surrogacy facility in the United States, Joanne Ramos' novel *The Farm* extrapolates both from social realities in the realm of commercial surrogacy and from recent developments in the field of assisted reproductive technology (ART). In doing so, *The Farm* negotiates the use of reproductive science and technology as biocapitalist instruments of extractivism, and it envisions commercial surrogacy as a form of privatized colonialism which operates according to racist, classist, and heterosexist principles. The novel thus visualizes how the increasing privatization of ART further exacerbates reproductive inequalities, and it demonstrates how the biocapitalist reproduction of the few occurs at the cost of the many. At the same time, the novel's own formal alignment with the premises of biocapitalism as well as the text's significant historical and gender gaps undermine its attempt to criticize the substantial inequalities which result from biocapitalist developments in the field of reproduction.

KEYWORDS biocapitalism, capitalist realism, commercial surrogacy, *The Farm*, science and technology

Published in 2019, Filipina-American writer Joanne Ramos' debut novel *The Farm* reimagines existing so-called surrogacy farms as a luxury surrogacy facility in the United States. This facility offers those who are privileged not only a remedy for fertility problems but also promises streamlined processes of gestation as well as the production of optimized offspring. By extrapolating both from social realities in the realm of commercial surrogacy and from recent developments in the field of assisted reproductive technology (ART), the novel negotiates the use of reproductive science and technology as biocapitalist instruments of extractivism and envisions

commercial surrogacy as a form of privatized colonialism which operates according to racist, classist, and heterosexist principles. *The Farm* thus visualizes how the increasing privatization of ART further exacerbates reproductive inequalities and demonstrates how the biocapitalist reproduction of the few occurs at the cost of the many. At the same time, and as this article will show, the text's own formal properties undermine its critical gesture.

While there is hardly any scholarly literature on *The Farm* as of yet, the novel has attracted wide public attention. It has been chosen by many book clubs, not least the *BBC Radio 2 Book Club*, and has received numerous reviews, for instance in *The Guardian*, *The New York Times*, and the *Los Angeles Review of Books*. Although the novel's speculative gesture limits itself to assembling a number of existing elements—such as surrogacy centres and technologies of reproduction, surveillance, and self-optimization—into a luxury surrogacy facility situated in the United States, *The Farm* has repeatedly been reviewed as one of the many recent “fertility dystopia[s]” (Evans 2019; cf. Heing 2019; Phelan 2019), or interpreted as a work of speculative fiction (cf. Gebauer 2020). Since—albeit much less luxurious—so-called ‘surrogacy hostels’ were a common practice in India up until the official ban of commercial surrogacy in 2021 (Pande 2010, 970; cf. Cherry 2014, 265), this recurrent reading of the novel as a dystopia indicates that, despite portraying surrogacy as a privatized form of colonialism, the text invites Western-centric interpretations.

More generally, these Western-centric interpretations result from a double standard which is often at work in readings of Western dystopias: here, the dystopian element largely relies on a geographical relocation, which means that a story with a Global Northern setting evokes conditions similar to those already existent in the Global South (cf. Wurr 2024, 2). In this regard, readings of *The Farm* as speculative or dystopian fiction are no exception; yet they reveal that in many fictionalizations of infertility, “[a]t stake is not really the question of human reproductive capacity but of reproductive futurity: whose fertility and family structures will be preserved? Who will inherit the Earth?” (Vint 2021, 79). More specifically, however, this article suggests that such biased readings of *The Farm* stem from the blind spots in the novel's own negotiation of biocapitalist reproduction, that is, from the text's neglect of not only biocapitalism's historical origins but also of its contemporary aesthetic and ideological configurations.

This article thus argues that the novel's attempt to criticize the substantial inequalities resulting from commodifiable developments in the field of reproduction ultimately remains futile. On the one hand, the text employs an intersectional critique narrativized by means of variable focalization

and juxtaposition as well as a speculative gesture to extrapolate how an increasingly biocapitalist use of science further exacerbates reproductive exploitation. On the other hand, however, the text adopts a capitalist realist mode which deflects a systemic critique. According to Mark Fisher, capitalist realism can be understood as “the widespread sense that not only is capitalism the only viable political and economic system, but also that it is now impossible even to *imagine* a coherent alternative to it” (Fisher 2009, 2, emphasis in original). While capitalist realism thus refers to a market-based sociotechnical imaginary which allows no alternative thinking (cf. Jasanoff 2015, 4; Fisher 2009, 2; Vint 2021, 7–8),¹ this article conceptualizes the capitalist realist mode as a specific form of writing which is inextricably linked with reproductive futurism, that is, with the perpetuation of the current social order through heteronormative reproduction (cf. Edelman 2004, 2, 25). Without suggesting that realist writing *per se* is capitalist, this article shows how the specific capitalist realist mode employed in *The Farm* is structurally and stylistically aligned with the premises of biocapitalism, and that it is characterized by a capitalist realist “*precorporation*: [that is,] the pre-emptive formatting and shaping of desires, aspirations and hopes by capitalist culture” (Fisher 2009, 9, emphasis in original). In the novel, this precorporation not only finds expression on the level of form but also manifests itself—both literally and metaphorically—in the desire for optimized children, that is, in the ideas of prenatal enhancement and competitive child-rearing.

In order to discuss the tensions between *The Farm*’s criticism of biocapitalist reproduction and the biocapitalist realist mode which the novel adopts to express this criticism, this article will first provide some contextual information on ART and on universalizing notions of biological life in times of biocapitalist globalization. By means of close reading, the article will then analyse *The Farm*’s negotiation of science and technology as biocapitalist instruments of stratified reproduction, and it will discuss the frames in which the novel negotiates the fragmentation of motherhood. In doing so, the article will pay particular attention to how *The Farm* employs variable focalization and juxtaposition as a means of criticizing the unequal impact which the privatization of ART creates, and to how the text’s own biocapitalist overdetermination as well as its writing out of

1 Sheila Jasanoff defines the “sociotechnical imaginary” as “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology” (2015, 4, quoted in Vint 2021, 7).

African-American surrogate mothers undermine its critical gesture. The article closes by reflecting on the implications of the text's biocapitalist sociotechnical imaginary of surrogacy.

ART, Biocapitalism, and Universalizing Notions of "Life Itself"

From the mid-twentieth century onwards, but especially in the last few decades, technoscientific advances in ART such as artificial insemination, in vitro fertilization (IVF), the cryopreservation of gametes or embryos, and genetic screening and diagnosis have engendered massive changes in the reproductive realities of groups that are already considered advantaged (cf. Harding 2011, 14; Sándor 2019, 176; Browner 2016, 818–19). Not only has the increasing use of ART triggered controversial debates about the substantial inequalities regarding both the access to and the distribution of the costs and risks of reproductive innovations, it has also fundamentally changed the expectations towards human reproduction as well as the sociotechnical imaginary of the latter (cf. Sándor 2019, 176). In fact, ART no longer serves as a remedy for people with fertility problems only. To those who have access to it, ART also gives more control over their reproductive choices, for instance, the option of postponing childbirth, of sex selection, and of ensuring enhanced health for their offspring or of healing sick children in the family (cf. Sándor 2019, 174). In this extended use, ART is, firstly, in line with a shift in biomedicine from the practice of healing and preventative health to a government of life "concerned with our growing capacities to control, manage, engineer, reshape, and modulate the very vital capacities of human beings as living creatures" (Rose 2007, 3). Secondly, the extended use of ART also reinforces stratified reproduction, that is, the fact "that physical and social reproduction tasks are accomplished differentially according to inequalities that are based on hierarchies of class, race, ethnicity, gender, place in a global economy, and migration status and that are structured by social, economic and political forces" (Colen 1995, 78).

Apart from epitomizing a pronounced shift in biomedicine which reinforces stratified reproduction, ART has also contributed to the further differentiation of reproductive roles. If biomedical innovations such as hormonal contraceptives and artificial insemination had already prepared the fragmentation of motherhood, ART was instrumental in realizing it, so that "[...] today it is possible, for the first time in human history, to distinguish not only between social and biological motherhood but also between various modalities of biological motherhood, such as genetic

motherhood, gestational motherhood, and even, some might argue, mitochondrial motherhood” (Gunnarsson Payne 2019, 13). In commercial surrogacy arrangements, such a fragmentation of reproductive roles as well as the intricate link between reproductive technology, reproductive justice, and social inequality are particularly pressing, especially when they perpetuate colonial patterns of extractivism.

Such a perpetuation of extractivist patterns is, among others, facilitated by the universalizing notion of “life itself” (Lettow 2018, 14)—a notion which also underlies many definitions of biocapitalism. Biocapitalism is a term used to describe the systemic politico-economic, but also cultural and epistemic transformations engendered by the growth of global bio-industries such as the reproductive industry. According to Susanne Lettow, biocapitalism “refers to processes of the primary valorization of materials derived from human bodies and nonhuman living beings, to the meaning of these processes for capitalist accumulation strategies and to related transformations of modes of labour, exploitation and subjectivation” (2018, 13; see also Rajan 2006, 1–36). As biocapitalism thus crucially relies on the primary valorization of “organic or sub-organic materials and processes” through the life sciences, universalizing notions of “life itself” often undergird analyses of the phenomenon (Lettow 2018, 14; see also Pravinchandra 2016). However, materials such as molecules, cells, genomes, and genes or processes such as surrogacy and organ donation “do not exist in unmediated ways but [...] are made accessible or generated only through techno-scientific procedures, and thus knowledge production and technological intervention” (Lettow 2018, 14). In order to conceptualize biocapitalism, it is therefore not “life itself” but the specific spatio-temporal situatedness of biocapitalist processes, practices, and relationships within global power differentials which needs to be analysed (cf. Lettow 2018, 14).

The Farm

Set in the US and illustrating that “biomedical science can be colonizing in spaces that are not [officially] recognized as colonial” (Towgi and Vora, quoted in Mendes and Lau 2019, 325), *The Farm* constitutes an insightful case study when it comes to considering how the extractivist use of commercial surrogacy results in a form of biocapitalist colonization which not only upholds and extends imperial structures, but which also creates new reproductive needs and expectations (cf. Lettow 2018, 14). As the following close reading will show, the novel fictionalizes ART as a form of biocapitalist colonialism which offers those who are privileged not only a remedy for

fertility problems but also “the selection of embryos and fetuses imbued with certain traits considered desirable by prospective mothers and parents (e.g., sex, the absence of known genetic anomalies)” (Browner 2016, 818–19). In fact, and as indicated by the facility’s evocative official name, at Golden Oaks, everything is geared towards creating babies optimized according to their parents’ competitive expectations. The surrogate mothers, who are only paid small monthly instalments before receiving the big final bonus on the condition of delivering a baby considered healthy, are on a diet of superfoods and constantly surveyed by means of weekly ultrasounds and the so-called “WellBand,” a tracking device. In addition, they also have regular appointments for attaching “UteroSoundz speakers” to their stomachs, that is, speakers which expose the unborn babies to a programme which consists of classical music, the speeches of powerful men, and poetry in multiple languages and which is meant to enhance the foetus’ competitiveness (cf. Ramos 2019, 134). For Mae, the general manager of Golden Oaks, both such mechanist stimuli and the idea that “fetal potential” (Ramos 2019, 108) can be equalled with the foetus’ “profit-producing potentiality” (Vint 2021, 137) seem completely logical: “Why not give their firstborn a jumpstart in life in an environment calibrated *explicitly* to maximize his fetal potential?” (Ramos 2019, 108, emphasis in original). As the male possessive pronoun in Mae’s thought indicates and as is confirmed throughout the novel (cf. Ramos 2019, 292), the selection of traits, for instance in the form of son preference, is intricately interwoven with the idea of maximizing “fetal potential” (see also Ramos 2019, 71).

This mechanist and instrumentalized conception of biological life in the form of capitalist precorporation determines all interactions at “the Farm.” It is reflected by the fact that, at Golden Oaks, everyone is instrumentally referred to by means of their capitalized function, for instance, “Hosts,” “Clients,” “Coordinator,” but also “Baby,” and becomes increasingly apparent as the plot progresses: Jane, a Filipina immigrant and the novel’s protagonist, has just given birth to Amalia, her first child. Having left her unfaithful husband, Jane now lives in a crammed dormitory with her elderly cousin Ate and numerous other immigrants. When Ate, herself a well-paid and highly recommended baby nurse, is too ill to nurse the newborn son of millionaires whom she normally works for, she asks Jane to fill in for her. During this assignment, Jane encounters many racist and classist micro-aggressions; in addition, she first experiences how enormous amounts of money are spent on optimization. Due to an unfortunate series of events, however, Jane loses this job. Bitterly blaming herself, she meekly agrees when Ate advises her to become a surrogate at Golden Oaks. With a heavy heart, Jane leaves Amalia in her cousin’s care, hoping

that with the huge bonus upon delivery, she will be able to build a better life for her daughter. Isolated from Amalia during the pregnancy, Jane at first frantically but unsuccessfully tries to adhere to Golden Oaks' strict rules, even when she witnesses the medical risks shouldered by Anya, a surrogate who undergoes a forced late-term abortion, and by Reagan, who develops a lump near her collarbone. However, when Mae repeatedly cancels Ate and Amalia's visits, Jane increasingly despairs. Driven by the conviction that her daughter's visits are terminated because Amalia is ill, Jane becomes so desperate that she agrees to a plan to escape from Golden Oaks devised by Reagan and Lisa. Jane, who has discovered in the meantime that she is carrying the "billion-dollar baby" (Ramos 2019, 84; 151), that is, the baby of a Chinese billionaire who is willing to pay an enormous bonus upon delivery, thus flees from Golden Oaks. When she finally reaches the hospital where she thinks Amalia is treated, Jane has to realize that Ate is the one who is terminally ill. Having violated her contract, Jane loses the bonus for the child she finally delivers. With no qualified education and in a precarious situation again, she first accepts Mae's offer to become the surrogate of Mae's own child and then to work for Mae as her son's nanny.

In narrativizing this plot, *The Farm* strongly relies on variable focalization and juxtaposition, both of which serve to demonstrate that under biocapitalist conditions, biomedical advances—far from serving "life itself"—very much follow a logic of supply and demand in which a "surplus population, [deemed] not worth the costs of its own reproduction, is strictly contemporaneous with the capitalist promise of more abundant life" (Cooper 2008, 61). In its attempt to assemble a multi-perspectival picture of surrogacy which also gives a voice to those who are often written out of the record—that is, the surrogate mothers—*The Farm* presents the differential impact of technoscientific advances in ART through the eyes of four different focalizers. While Mae, a Harvard graduate and the blond daughter of an American mother and a Chinese immigrant, epitomizes self-optimization and consumerism in their most ruthless form, Ate, a Filipina immigrant, turns her rich clients' wish for optimized offspring into money. Leading a precarious lifestyle in the US, Ate sends most of this money to the Philippines to provide for her old age and for her children, especially her son Roy, whom an accident has left dependent on full-time care. Reagan, who comes from a wealthy white family and has a university degree, becomes a surrogate because she thinks she can combine altruistic with financial goals in this way. Suffering from the fact that her mother has dementia and having a strained relationship with her careerist father, Reagan wants to become independent of her father's financial support and earn the financial means to become a photographer while at the same time doing something meaningful by

helping an infertile client. At Golden Oaks, Reagan becomes a so-called “Premium Host,” she “represents the holy triffecta” which Golden Oaks looks for in such surrogate mothers: “she is Caucasian (a winsome mix of Irish and German, Mae discovered during their interview), she is pretty (but not—and Mae knows from experience this is critical—sexy), and she is educated (cum laude from Duke University—smart—but not intimidatingly so)” (Ramos 2019, 42). The novel juxtaposes Reagan’s experiences as a surrogate mother with those of Jane, a Filipina immigrant who does not have a degree and lives in precarious conditions. Jane becomes a “regular” surrogate mother (Ramos 2019, 49). She epitomizes the dehumanizing adversities which migrant workers have to face when they are racialized and reduced to their labour-power while at the same time being restricted in their mobility and employment opportunities (cf. Vint 2021, 49).

By means of juxtaposing its different focalizers—three of whom are from ethnic minorities and have a recent experience of migration in the family—the novel fictionalizes the complicated and changing “relationships between the local and the global in postcolonial technoscientific settings” (Seth 2017, 71; see also Anderson 2002, 643) as a form of biocapitalist colonialism in which the “enhanced possibilities for the (human) subject of interest are coproduced with expulsion from this human community for the racialized subject” (Vint 2021, 16). Through the use of juxtapositions, the text moreover raises the question of who should benefit from research advances—an issue which is particularly pressing given that in the US, since the neoliberal reforms in the Reagan Era, private players can own and extract profit from patents developed using public funding (cf. Vint 2021, 74). While *The Farm* thus shows how profitable the scientific advances in ART are, it contrasts them, for instance, with the lack of a dementia cure for Reagan’s mother. Furthermore, the novel juxtaposes elaborate contraptions such as the “UteroSoundz” speakers with Ate’s makeshift attempt of using a Walkman and headphone to provide her son Roy with music therapy (cf. Ramos 2019, 158–59).

In order to narrativize different biomedical technologies pertinent to gestational surrogacy, *The Farm* frequently intersperses the main plot with scientific details and thereby presents technoscience as permeating all aspects of life—not just those of the surrogate mothers, but of all those who self-optimize, too. In particular, the novel interweaves hormonal treatment, cryopreservation, foetal implantation, ultrasound, the fictional “UteroSoundz” contraption, but also cancer biopsies into the storyline centred on Madame Deng, the Chinese billionaire whose baby Jane carries. First introduced through Mae’s perspective, Deng is presented as a client who does not limit herself to using the services of Golden Oaks. Instead,

Deng makes enormous investments in the reproductive sector. These investments guarantee her preferential treatment and access to services which, as the mention of the “Deng Center for Reproductive Health Studies at MIT” (Ramos 2019, 40) indicates, heavily depend not only on private investors’ money but also on these laypersons’ personal as well as scientific interests. Reactivating tropes of the ‘Yellow Peril’ and more recent US-American fears of China’s geopolitical and economic ascent (cf. Wing-Fai 2014), the novel gradually reveals that Madame Deng has eight of her frozen embryos—all stored at the Deng Center for Reproductive Health Studies at MIT—simultaneously implanted into eight different surrogates at Golden Oaks. By presenting the disastrous results of the implantations of Deng’s eight embryos, the text highlights the immensely unequal distribution of both risks and costs caused by one individual’s wish to procreate:

[Mae] reminds [Leon, Golden Oaks’ chief executive] that Deng’s eight viable fetuses were implanted in eight separate Hosts: 70, 72, 74, 76, 78, 80, 82, 84, with a less-viable/high-beta fetus implanted in 96. Three (70, 72, 76) spontaneously aborted within the first three weeks of implantation. Hosts 74 and 78 miscarried in weeks four and five, respectively. 80’s was terminated due to trisomy. Although the success rate thus far has been disappointing, Mae believes it’s served the purpose of demonstrating to Deng the exceedingly steep challenges Golden Oaks faces in attempting to bring her fetuses to term, given the advanced age of Deng’s eggs and her husband’s sperm at the time of fertilization. [...] [B]ecause 82 is a Premium Host, and because the fetus she carries is the male one, the revenue outcome would still be very attractive for Golden Oaks. (Ramos 2019, 292)

Mae’s detached cost-benefit analysis of the situation—which stands in stark contrast to the unsettling experiences which the surrogate mothers undergo—demonstrates how medical risks are priced into the commodification of surrogacy. With its “chaste clinical discourse that reduces the womb to little more than an incubator” (Bahri 2019, 315), Mae’s report to Leon illustrates the dehumanizing dangers of commodifying procreation. Firstly, it shows how the surrogate mothers are treated as numbers only (in one of the novel’s many intertextual nods, Jane features as “Host 84”). Secondly, Mae’s diction, which blends business speak with medical vocabulary and incorporates phrases such as “less-viable/high-beta fetus,” also highlights the great extent to which Golden Oaks’ biocapitalist promise of optimized offspring relies on neoeugenic ideals of what counts as desirable or disposable life.

By means of scenes such as the previous and for the greatest part of the plot, the novel casts Mae as an unsympathetic character who serves as a

mouthpiece for a biocapitalist thinking. The text also employs this strategy of indirect criticism in a conversation which Mae has with Dr Wilde shortly after the 16-week-old foetus Anya carries is diagnosed with mosaic trisomy 21. After Wilde, a medical doctor whose ethics and reliability the text undermines by indirectly characterizing her as a vain and consumerist agent of biocapitalism instead of as a healer (cf. Ramos 2019, 112), explains that “[s]ome children with mosaic Down’s have very mild features; but others have almost all the features of full trisomy,” Mae immediately reframes this medical issue as a legal and financial question: “She asks Fiona, her contact in Legal, to check whether the contract associated with 80 contains a fee clawback in the case of a defective child, and how exactly ‘defective’ is defined” (Ramos 2019, 113–14). Following Mae’s calculative assessment of the situation, both the elimination of the foetus and Anya’s suffering after the forced abortion further underline that Golden Oaks’ use of science does not serve to improve the lives of those living with or without disease, but to suppress any future deviations from an increasingly narrow norm. By means of this drastic example, the novel thus visualizes that at Golden Oaks, ART is used according to the logic of a neoliberal eugenics which discards some bodies as disposable. Instead of as a means of fulfilling an unconditional desire to have children, ART is consequently represented as a biocapitalist instrument of implementing homogenizing ideas of genetically related and non-‘defective’ children (Ramos 2019, 114).

Further criticizing the differential and competitive logics of neoegenic and biocapitalist uses of ART, the novel negotiates how cryopreservation, that is, the storage of frozen embryos, can serve as a competitive advantage in reproduction and biocapitalist precorporation. *The Farm* evokes cryopreservation in the storyline centring on Madame Deng. What Deng’s storage of the dozen frozen embryos illustrates is that, for those with financial means, cryopreservation serves as a measure of extending life cycles through prolonged and postponed reproduction (cf. Vint 2021, 44). Although the scientific reason for this ‘banking’ of embryos (instead of oocytes) is that the former withstand cryopreservation much better (cf. Twine 2015, 7), the fictionalized mention of the billionaire’s cryopreserved embryos evokes parallels between the ‘banking’ of human and of other forms of capital. While in a different text, this freezing of embryos into storable capital could be read as a more general metaphor of emotional coldness in biocapitalist uses of ART, in *The Farm*, it is critically evoked in its extreme use by a foreign investor only. Because of its limited application, this evocation of frozen and banked biocapital loses some of its critical potential. Nonetheless, it still visualizes one specific form of biocapital and points to another: because of advances in regenerative

medicine which rely on pluripotent stem cells, surplus embryos—from whom these stem cells can be harvested—have become a further resource for extending the lives of the affluent (cf. Vint 2021, 79).

Fragmented Motherhood and the Epigenetic Paradox

As discussed so far, *The Farm* tries to present a picture of commercial surrogacy which is critical of the biocapitalist stratification of reproduction and which rejects universalizing notions of “life itself.” However, as the following section will show, this criticism remains limited to individual biocapitalist uses of ART but challenges neither the systemic assumptions nor the aesthetic dimensions which precorporate it. So, notwithstanding that the novel criticizes the highly stratified privatization of technoscientific advances as a means of biocapitalist exploitation, the text hardly questions these techniques, their origins, or a mainly mechanistic and competitive understanding of biological life. For instance, while the novel negotiates paradoxical assumptions about epigenetics at the level of content, the text only juxtaposes these assumptions with idealized bionormative frames of motherhood; in contrast, it leaves the competitive and exploitative logic underlying the epigenetic paradox which it presents mostly unquestioned. At the diegetic level, this epigenetic paradox stems from the striking discrepancy between, on the one hand, Golden Oaks’ emphasis on epigenetic factors such as stress and nutrients and, on the other, the unquestioned appropriation of techniques which rely on alienated clinical labour and which evoke actual or metaphorical coldness. Even if Golden Oaks acknowledges the gestational mother’s epigenetic influence on the child, which occurs due to her circulation or via placental transfer of nutrients (cf. Gunnarsson Payne 2019, 27), it does not consider as relevant any factors which are not quantified or quantifiable in biochemical terms.

Such an ambivalence with regard to epigenetic influences on the unborn is in line with Deepika Bahri’s observations about the downplaying of the gestational mothers’ influence on the foetus often found in commercial surrogacy (cf. Bahri 2019, 312). This process of writing out the surrogate mother is achieved both by deemphasizing the affective ties between her and the baby and by emphasizing that there is no genetic link between them. As Bahri argues, such a deemphasis of the surrogate mother’s contribution is not only in line with “a partial, self-serving understanding of biology on a disturbing continuum with nineteenth-century racist science founded in genetic determinism” (312) but also tries to ignore that

[c]hildren born through gestational surrogacy, nourished by the blood and body of their host bodies, are obviously comprised of more than genetic material. In a profoundly meaningful sense, the majority of the cells in the bodies of the babies are made in a real womb, hybridized by the surrogate mother's blood, fluids, and diet. Indeed, restrictions against drinking and smoking during pregnancy are founded in the relevance of epigenetic factors in ensuring the healthy development of the fetus. (Bahri 2019, 312)

In *The Farm*, this partial and ambivalent understanding of epigenetics is—paradoxically—also partially and ambivalently criticized. As the following section will explore, this partial and ambivalent criticism results from a) the fact that, while the text presents the exploitation of surrogate mothers in a critical light, it still subscribes to the same capitalist ideals of exceptionalism as the forms of biocapitalist reproduction and precorporation it describes; and b) the fact that it features considerable gaps as to the origins of biocapitalism. What the novel presents in a critical light is the fact that, although gestational mothers at Golden Oaks are not regarded as simple vessels for carrying a baby (cf. Gunnarsson Payne 2019, 26), they are still treated as vital machines to be biochemically optimized during their pregnancy in order to produce optimized offspring. In this, Golden Oaks completely subscribes to biochemical epigenetic factors and follows research which shows that the gestational mother's stress levels and diet have an influence on the baby. Besides stipulating a rigid diet, regular exercise, and the use of optimizing apparatuses, Golden Oaks also relies on an intricate system of surveillance, the “Panopticon” (Ramos 2019, 11),² through which it monitors the surrogate mothers' every move and heartbeat. In contrast, the alienated relationship between the gestational mother and the unborn child or the mother's social isolation are only deemed worthy of consideration if they cause measurable stress levels. When Mae interviews Jane, the general manager therefore warns the potential surrogate mother: “Jane, there is one thing we *do* worry about with Hosts who have their own children: stress. Countless studies show that babies in utero who are exposed to excessive cortisol—which is a chemical released by the body when stressed—end up more prone to anxiety later in life” (Ramos 2019, 58, emphasis in original).

The Farm consequently illustrates how Golden Oaks' business model is based on a mechanistic understanding of life which allows the facility to profit from quantifiable epigenetic factors as well as from racialized, classed, and gendered so-called “Premium” characteristics in line with

2 Next to the entrepreneurial self as *the* model of self-formation in *The Farm*, the “Panopticon” serves as another reference to Foucault (cf. 1975) in the novel.

the clients' demands. Moreover, the text shows how any wider or affective influence which the gestational mother might have on the unborn child is downplayed at the surrogacy facility. Although Golden Oaks undertakes "monumental efforts [...] to make Clients feel good about outsourcing their pregnancies" (Ramos 2019, 81), doing so does not only rely on disguising but, in fact, emphasizes the alienation which underlies the commodified clinical labour of surrogacy. The text underlines this by means of a scene in which Reagan is completely ignored during her ultrasound, while the commissioning mother, who participates online, is continually addressed. Told from Reagan's perspective and thus inviting empathy for her, a privileged white "Premium Host," this scene contrasts the alienated surrogate mother's desperate wish to be included in new forms of kinship relations and family formation with how technologies of foetal imaging have changed common understandings of pregnancy and motherhood. As it foregrounds how Reagan—despite her obvious interest in the process—is disregarded both during the ultrasound and in the discussion of further procedures, this passage can be read as a criticism of how technologies of foetal imaging "displace the woman as the patient of care and substitute the fetus, encouraging an imaginary of the fetus as an independent entity rather than as dependent on the woman's body" (Vint 2021, 77–78). As Wilde and her client's complete disregard for Reagan indicates, this displacement of the woman as the patient of care seems to hold particularly true for surrogate mothers, who—due to the further fragmentation of reproductive roles in surrogacy—are reduced to functioning as one component in the gestational process only (cf. Vint 2021, 78; Wurr 2024, 7).

If the novel thus includes passages in which the surrogate mothers' focalization presents their reduction to vital machines in a critical light, the text furthers its criticism of the exploitation of surrogates by displaying Mae's ruthless ruminations. Through free indirect thought representation, it thus becomes clear that for Mae, a logic of assembling and rearing babies which builds on the writing out of the surrogates while at the same time trying to contribute seemingly perfect epigenetic conditions is not at all contradictory or questionable, but desirable. When Mae daydreams about turning Golden Oaks into "a high-end, one-stop shop" for the reproduction of the affluent (Ramos 2019, 107), she thinks of including "an egg and sperm bank," "embryo storage" and "postdelivery services, like on-demand antibiotic and allergen-free breast milk or, even, wet-nursing?" (Ramos 2019, 107–8). As Mae's slightly hesitant plan of offering "even" wet-nursing as a service suggests, she anticipates that—not least due its intricate connection to the history of slavery in the US—this practice still constitutes a taboo (in fact, Jane loses her previous job as a baby nurse because she cannot

prevent the client's baby from suckling at her own breast). Embedded in the accumulative sales-pitch rhetoric which structures Mae's daydreaming, this mention of wet-nursing can be read as the novel's only reference to the long historical entanglement of slavery and surrogacy in the US (cf. Wurr 2024, 6). Between the seventeenth and the second half of the nineteenth century, enslaved women were not only exploited as wet nurses but were also treated as commercial surrogates, who

were expected and forced through rape to reproduce more children who could be sold as commodities or used as slave labor. These slave mothers had no legal or maternal rights to the children they bore. Their children were commodities in a system of racialized slavery that structured the reproductive lives of millions of women and was a form of forced surrogacy. (Twine 2015, 17)

So even though *The Farm* highlights how, in a globalized world, it is mostly migrant women who perform alienated clinical labour, the text neglects to consider the continuations between the constitutive role of forced surrogacy in chattel slavery and contemporary biocapitalist and racial capitalist practices of surrogacy (cf. Weinbaum 2019, 29–60). This omission is particularly noticeable in the visible absence of African-American surrogate mothers in *The Farm*. If, at the diegetic level, the near absence of African-American surrogate mothers (cf. Ramos 2019, 172, 61, 49, 115) can be explained by Golden Oaks' racialized logic of supply and demand, the novel as a whole replicates the writing out of this particular group by foregoing addressing their historical importance as forced surrogate mothers in chattel slavery's system of commodified reproduction. If one possible interpretation of *The Farm*'s title might be to read it as an allusion to chattel slavery's plantations and its dehumanizing practice of classing enslaved people as chattel and livestock, this allusion remains rather vague, given that the title can be interpreted in numerous other ways.³

Although *The Farm* thus omits negotiating the historical origins of commodified reproduction in the US, the novel does explicitly address

3 Besides alluding to existing so-called surrogacy 'farms' in countries of the Global South (cf. Pande 2010, 971), *The Farm*'s title also serves as a reminder of the origins of ART in animal husbandry, in which breeding by means of IVF also followed the goal of producing profit (cf. Vint 2021, 75). The title can also be interpreted as an oblique and inverse reference to another form of fragmented and commercialized motherhood, that is, the historical practice of "baby-farming" in Victorian Britain, in which usually illegitimate children were given to baby-farmers in exchange for a fee (cf. Stuart-Bennett 2022).

the racialized logic which—reflecting earlier desires for racial purity (cf. Bahri 2019, 315)—underlies surrogacy. The text clearly signals this by stating repeatedly that, in order to qualify as a “Premium Host,” a surrogate mother has to be “Caucasian” (see, for instance, Ramos 2019, 42, 172). In particular, the novel stages a highly racialized and classist conversation between Mae and Leon, in which they discuss options to further increase the profits which they reap by hiring gestational mother workers. In this conversation, which the novel clads in caricatural exaggerations in order to create some critical distance from Mae and Leon’s highly discriminatory brainstorming, it becomes clear that—although characteristics such as socio-economic status also play a role in the selection of “Premium Hosts”—it is racialized ideas which ultimately determine whether a woman counts as “Premium” at the facility. While racialization thus remains crucial in Golden Oaks’ business model, it is nonetheless modified by classist differentiation. By having Mae and Leon discuss the idea of hiring “lower-middle-class white girls” (Ramos 2019, 172–73) as surrogates, the novel vividly illustrates that, especially when privatized and market-oriented, innovations in reproductive science do not only “follo[w] patterns of resource extraction established by colonialism,” but also increasingly extend them to “those not previously marginalized by race” (Vint 2021, 76, 60).

By emphasizing the racialized, classed, and gendered selection criteria at work in Golden Oaks, the novel shows that—exceeding the epigenetic influence of surrogate mothers by far—these criteria do not only betray the nexus between biocapitalism and racial as well as class politics, but are also indicative of how a biopolitical futurity perpetuates historical anxieties. On the one hand, these criteria rely on “a geopolitics of desire coupled with persistent anxieties about racial, and dare we say inter-class, mixture” (Bahri 2019, 315) which hark back to how earlier “anxiety about hybridity reflected the desire to keep races separate” (Young 1995, quoted in Bahri 2019, 315). On the other hand, the clients’ choice of a surrogate mother also indicates what prominent a role self-optimization plays in reproductive futurism and biocapitalist precorporation: as reflected in Mae’s thought that the surrogate mother serves most clients as “an emblem of the lofty expectations they have for the being to be implanted inside” (Ramos 2019, 42), the production of optimized offspring is seen as essential in being able to perpetuate through heteronormative reproduction a future social order which continues to guarantee exclusive privileges to those who already have them (cf. Edelman 2004, 2, 25).

Whereas, as shown above, at Golden Oaks, epigenetic influences are priced in as long as they are quantifiable and commodifiable, the novel’s only counterpoints to such exclusively quantifiable biochemical and

mechanist understandings of optimized foetal development—naturalized and stereotypical frames of motherhood and child-rearing (see, for instance, Ramos 2019, 4, 6, 311)—themselves follow the logic of biocapitalist reproductive futurism. Although Jane retrospectively evaluates her pregnancy with Amalia as un-optimized, her daughter turns out to be gifted—a development which is depicted towards the end of the novel and which seems to result from the combination of Jane’s motherly love for her daughter and Mae’s influence on Amalia’s competitive skills (cf. Ramos 2019, 313). In addition to representations of Jane and Amalia, the novel invokes naturalized frames of motherhood by including the memories which Reagan has of her own mother’s beneficial influence during her childhood (cf. Ramos 2019, 134, 136, 147). Creating a stark contrast to this implicit normative standard, Mae’s experiences serve as a foil which reinforces instead of questions these idealized frames of motherhood. Mae, for whom the surrogate mothers’ alienated clinical labour is completely acceptable and who calls Golden Oaks her “baby” (Ramos 2019, 169), has never felt loved by her own mother (cf. Ramos 2019, 42). Yet, towards the end of the novel, when the novel suddenly begins to present Mae in a more favourable light, she also begins to wonder whether she is not forfeiting a chance if she does not carry her second child herself. Any nuanced representations of motherhood between these two extremes are, however, not included in the novel. Because of this, and despite the novel’s attempt at providing some variations on the issue of nature versus nurture by focusing on Amalia, the only alternative to assisted reproduction which the text suggests as a way of securing one’s offspring a place in a stratified future thus defaults to frames of naturalized conventional motherhood enhanced by competitive rearing.

The novel’s epilogue shows exactly this: as Jane performs Mae and her husband’s entire reproductive labour for their son (who, tellingly, is named Victor), Jane hopes to be able to provide Amalia with a better future. In the logic of *The Farm* and as suggested by the end of the novel, this better future consists of soaring as high as possible:

“Mama, push me!” Amalia shouts, climbing onto the swing and flinging off her hat.

[...] “Hurry, Mama. Hurry!”

Jane takes her place behind her daughter. She can push harder now without Victor to hold, and both arms free. “Hard or soft, Mali?”

“The hardest!” cries Amalia. “The highest!” (Ramos 2019, 321)

Pushed as hard and as high as possible by their parents, who focus their entire strength on their offspring's reaching of superlatives, the child's internalized wish and ability to compete thus mark the ending of *The Farm*. Merging this neoliberal telos with its structurally prominent ending, the text consequently displays a considerable structural congruence with the very premises which also underlie the biocapitalist exploitation which *The Farm* tries to criticize. In an affirmative reading of the novel, this ending could be interpreted as illustrating the very inevitability of capitalist realism—that is, its inability to envision any alternative to capitalist societal models and precorporation (cf. Fisher 2009, 2). Nonetheless, as the novel presents its ending by means of naturalized and bionormative frames of motherhood—which the text itself has introduced in an affirmative way and which are in line with reproductive futurism—this article reads *The Farm* as not only negotiating and criticizing but as also being partially and ambivalently precorporated by biocapitalist realist premises itself.

Sociotechnical Imaginaries: Reproductive Futurism and Biocapitalist Realism in *The Farm*

As has been discussed so far, its attempts at a differentiated intersectional critique of the entanglement of biotechnology, neocolonialism, and capital notwithstanding, *The Farm*'s own biocapitalist realist mode undermines the novel's criticism of biocapitalist exploitation. This complicated relationship between the novel's content and form is what makes the present case study so insightful. While reproduction serves as a frequent object of research in studies on biocapitalism in the social sciences (see for instance Lettow 2015, 36–38; Cooper and Waldby 2014, 33–88), this article's reading of *The Farm* contributes to the research on biocapitalism by exploring its aesthetic reproduction. In particular, it shows that, if clad in a capitalist realist mode itself, a critique of biocapitalist inequalities falls short of addressing systemic relations and instead affirmatively negotiates individual competitiveness as a means of empowerment or of keeping pace with so-called biocapitalist enhancement. Moreover, given the “sense of exhaustion, of cultural and political sterility” (Fisher 2009, 7) which underlies the capitalist realist inability to think in alternatives, exploring the nexus between this mode of writing and biocapitalist concerns with sterility can also contribute to explaining why infertility has become such a widespread topos in contemporary fiction (cf. Vint 2021, 22).

In addition to manifesting itself in the text's ending—which affirmatively reproduces the necessity for exceptional offspring instead of

presenting alternatives to it—the novel’s capitalist realist mode is reflected in Mae’s rhetoric or in detailed descriptions of luxury goods, which are imbued with a fascination for capitalist accumulation. Whereas most of the fascination for luxury goods in the text can be attributed to the choice of focalizers and to the absence of a non-implicated narrator, the novel’s telos nonetheless affirmatively follows a logic of accumulation instead of redistribution or social justice (cf. Vint 2021, 8). If all of the focalizers are too implicated to reject a (self-)accumulative way of living, the novel nevertheless culminates in a capitalist realist iteration of reproductive futurism epitomized by the exceptional child, who—although the daughter of an immigrant—will further stabilize this order by thoroughly assimilating to while superficially diversifying the predominant order.

In combination with the text’s significant historical and gender gaps, the novel’s biocapitalist realist mode creates a sociotechnical imaginary which ultimately continues to rely on—and even reproduces—reproductive futurism. In fact, besides the novel’s omission of the long history of forced surrogacy during slavery, there is also a paradoxical absence of a wider gender perspective in the text. Although some feminists and radical post-humanist thinkers argue that ART could be instrumental in deconstructing heterosexist and bionormative structures of procreation (cf. Lewis 2019; Karmakar and Parui 2020, 324–25; Browner 2016, 819; Harding 2011, 21),⁴ none of these options are explored in the novel. Whereas ART offers “infertile women and couples and other individuals conventionally excluded from becoming parents (e.g., homosexuals, transgendered individuals, people living with HIV/AIDS, partnerless and postmenopausal women) the chance to reproduce” (Browner 2016, 819), *The Farm* focuses almost exclusively on postmenopausal women or women choosing to use a surrogate for aesthetic reasons (cf. Ramos 2019, 108, 218).⁵ In addition, the novel neither addresses how ART “can also serve as a source of pressure, perpetuate gender inequalities, reinforce women’s primary roles as mothers, and, perhaps most significantly, valorize biological reproduction above all other means of family formation” (Browner 2016, 819), nor does it interrogate the intersection of capitalism and the family as a vital structural principle in capitalist reproduction. Instead, the text juxtaposes the exploitative

4 On the “uncritical acceptance of technology as a liberating apparatus in feminist and radical posthumanist theory,” see Karmakar and Parui 2020, 324–25.

5 Through a flashback, the text provides the information that Reagan donated her eggs to a “[s]table, college-educated Buddhist couple” (Ramos 2019, 77). Although not specified, this couple might be the novel’s only mention of queer people using ART.

practices of ART with idealized frames of biological motherhood only. The sole alternative to exploitative surrogacy which the novel envisions thus relies on an affirmative nostalgia for naturalized frames of motherhood.

In sum, despite its attempt to explore the role of biocapitalism in exacerbating inequality, *The Farm* is too overdetermined by its own capitalist realist mode to be able to create a sociotechnical imaginary which overcomes or convincingly criticizes a highly stratified biocapitalist reproductive futurism. Instead, the text formally reduplicates the implications of a use of reproductive technologies which is “more conforming than liberating: they more often than not reinforce the status quo than challenge it” (Roberts 2001, quoted in Karmakar and Parui 2020, 326). So even if the text does try to forego universalizing notions of “life itself” and instead focuses on how biocapitalist developments further reinforce the stratification of reproduction, the blind spots in the text’s own negotiation of biocapitalist reproduction nonetheless invite universalizing and biased readings which neglect that—far from speculatively dystopian—biocapitalism perpetuates the long history of stratified and exploitative reproduction.


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From climate change to global pandemics, some of the most vexing questions facing postcolonial societies are entangled with the contradictory roles of science in postcolonial contexts. Science is connected to histories of colonial oppression but also to promises of improvement and emancipation; it may be the cause of environmental degradation but also its remedy. This volume engages with the cultural imagination of science and problematises the role of narrative at the intersection of culture and the sciences. Bridging postcolonial studies, literature and science studies, and other traditions, the contributors examine cultural narratives as well as texts from 19th-century utopianism to postcolonial 'science novels' and contemporary science fiction.

