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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"

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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 *post*colonial to denote an exegetic practice which is, in its ethical investments, linked to *anti-* and *de*colonial 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 valuate 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 autodiegetic 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 Foucaldian 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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