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# Representations of Science in Twenty-First- Century Fiction

Human and Temporal Connectivities

*Edited by*  
Nina Engelhardt · Julia Hoydis

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Nina Engelhardt • Julia Hoydis  
Editors

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*Editors*

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# CONTENTS

<b>1</b>	<b>Introduction: Connectivities Between Literature and Science in the Twenty-First Century</b>	<b>1</b>
	Nina Engelhardt and Julia Hoydis	
<b>2</b>	<b>The Rise of Psychopharmacological Fiction</b>	<b>19</b>
	Natalie Roxburgh	
<b>3</b>	<b>Neuropathologies: Cognition, Technology, and the Network Paradigm in Scott Bakker's <i>Neuropath</i> and Dave Eggers's <i>The Circle</i></b>	<b>37</b>
	Julius Greve	
<b>4</b>	<b>New Science, New Stories: Quantum Physics as a Narrative Trope in Contemporary Fiction</b>	<b>55</b>
	Kanta Dihal	
<b>5</b>	<b>Digital Technologies and Concrete Poetry: Word, Algorithm, Body</b>	<b>75</b>
	Paola Carbone	
<b>6</b>	<b>Towards a Posthumanist Conceptualization of Society: Biotechnology in Margaret Atwood's <i>MaddAddam</i> Trilogy and Ruth Ozeki's <i>All Over Creation</i></b>	<b>93</b>
	Pia Balsmeier	

7	<b>Genealogies of Genetics: Historicising Contemporary Science in Simon Mawer’s <i>Mendel’s Dwarf</i> and A.S. Byatt’s <i>A Whistling Woman</i></b>	113
	Paul Hamann	
8	<b>The Lures and Limitations of the Natural Sciences: Frances Hardinge’s <i>The Lie Tree</i></b>	133
	Elizabeth E. J. Gilbert	
9	<b>“It’s for Fellows Only!”: On the Postcolonial Stance of Matthew Brown’s Maths Film <i>The Man Who Knew Infinity</i></b>	153
	Norbert Schaffeld	
10	<b>Thomas Pynchon’s <i>Against the Day</i> and the Technologies of Modernism</b>	173
	Simon de Bourcier	
11	<b>Identity, Memory, and Technoscientific Ethics: Limits, Edges, and Borders in <i>The Forbidden Zone</i></b>	193
	Ellen Moll	
	<b>Correction to: Connectivities Between Literature and Science in the Twenty-First Century</b>	C1
	Nina Engelhardt and Julia Hoydis	
	<b>Index</b>	213

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## CHAPTER 1

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# Introduction: Connectivities Between Literature and Science in the Twenty-First Century

*Nina Engelhardt and Julia Hoydis*

Science and technology more than ever govern human lives. While it has become a commonplace observation that the twenty-first century is marked by scientific and technological change on an unprecedented scale, it remains a challenge to map the implications for contemporary fictional representations. The present volume tackles a specific part of this challenge, addressing scientific and literary innovations as well as continuities and returns. Twenty-first-century writing in the field of literature and science obviously stands in a long tradition of writers and scholars that “have

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reflected on, reimagined, and challenged the sciences for over two millennia” (Sielke 2015, 12), and the topic of science and/in fiction shows no signs of decline as the third millennium progresses, neither in terms of artistic production nor as an area of critical enquiry. In contemporary drama, for example, science has been seen to become “the hottest topic in theatre today, so much so that it’s identifiable as a millennial phenomenon on the English-speaking stage” (Rocamora 2000, 50). Likewise, there has been a wave of popular films about scientists over the last years, including screen works such as *A Beautiful Mind* (2001), *Proof* (2005), *Ramanujan* (2014), *The Imitation Game* (2014), *A Theory of Everything* (2014), *The Man Who Knew Infinity* (2015), and *Hidden Figures* (2016). In prose fiction, the “science novel” (see Schaffeld 2016) has attracted significant attention and branched out into a variety of topical interests and genres, running the gamut from popular science, speculative fiction, and apocalyptic disaster narratives to new realist and historical novels, including ‘brain memoirs’ (see Tougaw 2017, 2018) and ‘neuronovels’ (see Roth 2009), ‘cli-fi’ (see Johns-Putra 2016; Trexler 2015; Schneider-Mayerson 2017), and the field of ‘posthuman’ fiction, including, most recently, ‘AI narratives.’<sup>1</sup> In addition, the impact of digitalisation across all media and genres and on twenty-first-century culture in general affects modes of artistic and knowledge production and reception.

If the representation of science in novels, films, plays, and poetry does not show any signs of decline, neither does the field of literature and science studies. Recent scholarly publications predominantly focus on a single genre and a single scientific discipline, as a look at books published in the first half of the year 2018 reveals: Rachel Crossland’s *Modernist Physics: Waves, Particles, and Relativities in the Writings of Virginia Woolf and D. H. Lawrence*, Nina Engelhardt’s *Modernism, Fiction and Mathematics*, John Fitch’s *The Poetry of Knowledge and the ‘Two Cultures,’* Lianne Habinek’s *The Subtle Knot: Early Modern English Literature and the Birth of Neuroscience*, Jenni Halpin’s *Contemporary Physics Plays: Making Time to Know Responsibility*, Andrea K. Henderson’s *Algebraic Art: Mathematical Formalism and Victorian Culture*, and Michael Tondre’s *The Physics of Possibility: Victorian Fiction, Science, and Gender*. Unlike these books, this volume does not focus on any one particular genre or branch of science (e.g. physics, biology, or mathematics), yet, it shares with various publications a special concern with Victorian and modernist cultures and a focus on a specific time period—in our case, the ‘now.’ Thus, the volume breaks new ground with its focus on twenty-first-century representations of science, as well as by offering a comparatively rare com-

bination of contributions covering diverse scientific disciplines and different genres. Addressing novelistic fiction, poetry, film, and drama, and engaging with topics such as genetics, chemical weapons research, quantum physics, psychopharmacology, biotechnology, and digital technologies, this volume avoids delimiting the complexity of the field or the vagueness that investigations into the contemporary necessarily entail (see Boxall 2013, 3; Hoydis 2015, 5; Lea 2017, 2).

The organisation of ten case studies in two sections, ‘Human Connectivities—Speculations and (Corpo)Realities’ and ‘Temporal Connectivities—(Neo-)Victorian to (Neo-)Modernist,’ reflects that the contributions in this volume approach representations of science from two main angles: in view of the place of the human in a web of relations (human connectivities) and regarding links between the twenty-first century and historical periods (temporal connectivities). We introduce the term ‘connectivity’ specifically to liberate thinking about literature and science from the rather tired metaphor of ‘two cultures,’ the only slightly less tired derivatives ‘three cultures’ or ‘one culture,’ as well as from the increasingly popular all-embracing concept of ‘networks.’ Connectivity, as we understand it, does not emphasise boundaries, disciplinary cultures, or institutional settings but is relational and encompasses realities as well as potentialities: as in popular and technical usage, we take ‘connectivity’ to mean both the quality and state of being connected and the capability of “being connective or connected” (“connectivity,” Merriam-Webster). Referring to an actual state as well as to possibility, the use of ‘connectivities’ pays tribute to the both real and speculative aspects of representations of science in twenty-first-century fiction. As we develop below, the term evokes globality and technology as the central means of experiencing connections in the present day and age, yet equally allows for the incorporation of historical and ethical dimensions. First, however, we examine how using the concept of ‘connectivities’ to grasp the relationship between science and literature offers a way to bracket questions of linear influence and direct connections, as well as to break open (for lack of a better term) the ‘network’ paradigm which often seems to suggest a systemic view.

In the twenty-first century, the term ‘network’ and its derivatives are seemingly everywhere, from talk about the Internet, social networks such as Facebook, and Manuel Castells’s notion of the ‘network society’ as a society relying on the fundamental unit of networks that are based on flow of information in electronic forms and function on a global scale (see 2000, 60–1). Next to organisational networks and digital networking technologies, the term has undergone influential reconfiguration in Actor—Network

Theory (ANT), most closely related to the name Bruno Latour. Latour acknowledges the infelicity of the term in ANT, not least because what is meant to designate a method is frequently confused with a thing, for example a technical network. “Network is a concept, not a thing out there,” Latour explains, and admits, “The word network is so ambiguous that we should have abandoned it long ago” (Latour 2005, 131; 130). As a more fitting term to describe the work, movement, and change that the method entails, he offers ‘worknet’ but deems a change in terminology impractical (see 143; 132). This collection avoids the “terribly confusing” and “pretty horrible” (142) word ‘network’ with its competing meanings in common usage and ANT, and instead proposes to focus on ‘connectivity,’ which includes real and potential connections, local as well as global ones, and can involve merely two entities or an entire system.

If Latour has failed to eradicate confusions between ‘network’ as a method and the World Wide Web (Latour 2005, 143), the field of literature and science has not completely shaken off the influence and repercussions of the “two cultures debate”—and it is perhaps unlikely that it will ever fully transcend the binary divisions it stipulates. However, ever since C.P. Snow first introduced the idea of the humanities and the sciences as two separate spheres or cultures in 1959, scholars have attempted to reconceptualise the relationship and highlight communalities, cross-overs, and cross-fertilisation between disciplines. And some of these attempts have gone a long way to inspiring fruitful interdisciplinary debates. Jerome Kagan, for example, examines the natural sciences, the social sciences, and the humanities as “three cultures” and explores their interrelated struggles to “impose distinct meaning networks on their important concepts and [...] compete with each other for dominance” (Kagan 2009, 6). Meanwhile, prominent proponents of the ‘one culture’ model, such as George Levine, do not negate important differences between the disciplines but rather “attempt to consider ways in which literature and science might indeed be embraced in the same discourse, ways in which they have been so embraced” (Levine 1987, 3). As Levine emphasises: “The ‘one culture’ is *not* a unified science and literature” (4; original emphasis). Rather, as he goes on to explain, it is one culture in the following two senses: first, any developments and events in science affect everything else, including literature, and, second, both participate in a similar manner in “the culture at large—in the intellectual, moral, aesthetic, social, economic, and political communities which both generate and take their shape from them” (5–6). His is thus not an argument for collapsing the distinctiveness of science and literature into one indiscriminate ‘culture,’ but for identifying points of discursive

convergence. And in this respect, Levine points out, “it is important to consider precisely how they do, why they do, whether the convergence is fortuitous, whether it can lead to important illuminations, to something like real dialogue, to genuine ‘influence’” (4). This collection of essays is less concerned with dialogic ‘influence’—all texts explicitly represent and thus are obviously ‘influenced’ by scientific topics and practices—and we are similarly cautious about presupposing a ‘convergence’ of science and literature. Instead, the notion of ‘connectivity’ brackets the debate of how ever many culture(s) we should use as theoretical frames of investigation and allows for a looser, and thus more permissible, idea of actual and possible connections of science and literature.

The idea of connectivities is particularly important in the area of globalisation: “Most frequently, in the twenty-first century, discussions of globalization emerge from the perception of an unprecedented critical mass of *interconnectedness* across the world. Equally, seminal descriptions of globalization suggest that many of the key terms hinge on the belief in a growing escalation of this interconnectedness” (Childs and Green 2013, 1; original emphasis). The immense critical interest in globalisation and research into contemporary culture has found expression in a renewed focus on cosmopolitanism (Leggett and Venezia 2015; Schoene 2009; Shaw 2017) and theoretical concepts such as the planetary (Heise 2008) and cosmopolitanism (Moraru 2011, 2016). These are all linked by an inherent concern with the globe and a sense of connectedness through shared ethical responsibility. This understanding of ethical connectivity differs from the technical-spatial connectivities offered by forms of (data or human) travel and communication. Accordingly, in a recent study of contemporary fiction, Daniel Lea contrasts “the Internet’s architecture of connectivity” which reveals “its limitations as a tool of connection” (Lea 2017, 21) with another kind, namely “the duty of care that comes with humanness” (20). Christian Moraru’s notion of cosmopolitanism similarly proposes the period after 1989 to be characterised by relationality, or what he calls “being-in-relation, with another” (Moraru 2011, 2). Such relationality is manifested in fictional narratives as an identity that is always created in relation to a wider context, surpassing the geopolitical and cultural limits of the USA, Moraru’s area of focus. Cosmopolitanism’s inherent ethical investment marks its disparity, or rather its onwards progression, from postmodernism—implicitly understood as a more socially disengaged, merely aesthetic practice—and offers a “rationale and vehicle for a new togetherness, for a solidarity across political, ethnic, racial, religious and other boundaries” (5).

The concept of connectivity is also commonly evoked to refer to a technological environment that can now be taken for granted as a, more or less, global phenomenon: the Internet, which offers greater than ever access to scientific ‘knowledge,’ connections, and circulation. Not least, and importantly for ethical considerations, significant parts of interactions between humans take place in the digital world and some may even turn out to involve human as well as non-human interlocutors. Literary texts probe how such new connectivities shape twenty-first-century narrations of the human and humanity and their relations to reality. In his introduction to twenty-first-century fiction, Peter Boxall stresses the role of technology in questioning who we are: “The destabilisation of the category of the human is also fuelled over this time by developments in technology—in biotechnology as well as in computing and information technology—developments which of course fed into the philosophical and theoretical environment” (Boxall 2013, 88). Considering literary engagements with new technological forms and global relations, Boxall notes that texts contrast these with specific, material environments: “There is, in the fiction of the new century [...] a strikingly new attention to the nature of our reality—its materiality, its relation to touch, to narrative and to visuality” (10). Daniel Lea similarly identifies materiality as one of the recurrent concerns in the twenty-first century:

Interpreted in the broadest sense of the relationships between the physical stuff of the world and the individuals with whom it comes into contact, materiality is a strikingly recurrent concern of these novelists. This is perhaps most evidently articulated in response to the liquefaction and virtualisation of social relations that has rendered the physical dimension so abstract in the digital age. On what levels of communication does the physical heft of touch operate in a world where interaction is increasingly mediated by technology? (Lea 2017, 18)

The craving for materiality and reality that scholars detect in twenty-first-century fiction is also discernible in a shift from postmodernist playfulness to a new seriousness and realism, a currently widely discussed change in narratology and related fields. In 1998, Charles Altieri noted: “all the instruments agree that ‘postmodernism’ is no longer a vital concept for the arts” (Altieri 1998, 1). Similarly, four years later Linda Hutcheon challenged theorists to find new descriptive terms for twenty-first-century writing, after firmly declaring postmodernism to be “over” (Hutcheon



2002, 166), even though, she admitted, “its discursive strategies and its ideological critique continue to live on—as do those of modernism” (181). And this observation still holds true over a decade later, as the readings in this volume demonstrate. The pressures of the twenty-first century induce a turn away from playful experimentation with style and form, the proliferation of possibilities and worlds, and the questioning of objective truth, reason, and morality: many writers and other artists in the new millennium feel a need to move away from postmodernism and towards regaining sincerity and authenticity (see Hoydis 2019; Lea 2017; Vermeulen and van den Akker 2010, 2011). Where David Shields asks to respond to this “reality hunger” (2010), in his commonly evoked ‘manifesto’ of the same title, with ‘more authentic’ literary forms such as life writing or the essay, Boxall summarises for fiction more broadly: “one can see the emergence of new kinds of realism, a new set of formal mechanisms with which to capture the real, as it offers itself as the material substrate of our being in the world” (Boxall 2013, 10). This newly realist writing engages with the factual, the material, and the immediacy of things without merely returning to the style of classic nineteenth-century realism.<sup>2</sup> Rather, as Ulka Anjaria argues, realist fiction contains an “inbuilt paradox”—claiming allegiance to reality as well as to the ‘unreal,’ imaginative nature of fiction—that ensures that “21st-century realism is not a finished mode, but one perennially in progress” (Anjaria 2017) and thus constitutes an apt approach to explore the unfolding millennium.

Anjaria also helpfully examines the interrelations of notions of realism and connectivity. Twenty-first-century realism sheds new light, so she claims, on the question: “What is the relationship of literature to a world defined both by connectivity and fragmentation?” (Anjaria 2017). That is, a world characterised by the constant possibility of connecting with each other online and the disconnection of actual, physical lives. Meanwhile literary critic James Wood deplores a proliferation of relations and connectivities in literature that, so he argues, do not realistically represent reality and result in unconvincing stories abounding with seemingly coincidental but connected events: “what above all makes these stories unconvincing is precisely their very profusion, their relatedness. [...] Yet it is the relatedness of these stories that their writers seem most to cherish, and to propose as an absolute value. An endless web is all they need for meaning” (Wood 2000). Wood contrasts connectedness with reality, humanity, and life, arguing that connectivity plasters over a lack of humanity and realism: “since the characters in these novels are not really alive, not fully human,

their connectedness can only be insisted on,” rather than convincingly be shown (Wood 2000). Critical of Wood’s view and his celebration of nineteenth-century representations of character, Anjaria proposes twenty-first-century realism to be

not postmodernist, because it is receptive to the real conditions of the world it tries to represent, nor is it naively or nostalgically realist, because rather than hold a stable set of values as a response to the world, it refuses the formal closure characteristic of 19th-century realism in order to represent a reality constantly in flux. (Anjaria 2017)

The concept of connectivity can help us grasp this state of taking account of connections to the real and, on the other hand, exploring possibilities and likelihoods, which means staying open to and cultivating the capacity for connectivity; both aspects are of particular relevance for representations of science in contemporary narratives.

The discussion of a possible return to or the reworking of realism leads to another key concept in this collection, temporal connectivities, particularly between the twenty-first century and the Victorian period or literary modernism of the early twentieth century. While Anglophone literature on both sides of the Atlantic has a strong long-standing tradition of historical fiction, Britain has seen a particular boom of the genre over the past two decades: successful examples, to name but a few, include the works of Hilary Mantel and a general upsurge of Neo-Victorian and Neo-Edwardian novels and TV series such as *Sherlock Holmes*, *Penny Dreadful*, *Ripper Street*, *Downton Abbey*, and *Mr. Selfridge*. Neo-Victorian scholar Marie-Louise Kohlke suggests that the popularity of the genre is based “less on its historical accuracy than in its receptivity to ‘reverse projections’ of contemporary consciousness” (2015, 12), echoing a general function of historical fiction as a dual means of escape from and response to the contemporary (see also Miller 2011). Once more it appears that it is primarily the resurging concern with the ethical that reasserts itself in new fictions set in the past. Identifying temporality and “a fresh commitment to what we might call the reality of history” as one of the main topical and aesthetic concerns in twenty-first-century literature, Peter Boxall notes how this trend is explicitly linked to “a new sense of a *responsibility* to material historical forces that constrain or shape the fictional imagination” (2013, 41–2; original emphasis).

While there is consensus on these emerging topics and discussions across recent studies, a focus on how they relate to science in fiction is still missing. This volume addresses this gap. It ties in with studies of twenty-first-century fiction, but resolves one of the typically lamented issues, the obvious problem of dealing with a very wide, heterogeneous and yet hard to categorise field, by narrowing it down to fictions engaging with a topic included in all recent collections: science.

Considering the above, we might ask how the current engagement with the Victorian and modernist periods relates to fictional representations of science and is juxtaposed with the typically speculative view of science fiction, the genre that carries the connection between science and literature in its very name. Damien Walter identifies an emerging genre that is “not science fiction [... or] realism, but hovers in the unsettling zone in between” (Walter 2014) and proposes to use the term “transrealism,” as established by Rudy Rucker in the early 1980s. Transrealist texts, so Walter explains, are firmly rooted in reality while introducing a single fantastic idea: this does not allow for the comforts of confirming a stable reality or offering escapism but creates the disconcerting sense that “reality is at best constructed, at worst non-existent” (Walter 2014). Where Walter maintains that science fiction and mainstream literature “are increasingly hard to separate” (Walter 2014), science fiction writer Kim Stanley Robinson makes the related argument that wild speculations about scientific and technological inventions that characterised his genre in the early twentieth century are no longer possible today, as our lives are so saturated by science and technology that any speculation turns out to be reality already:

I think I do science fiction because I feel like if you're going to write realism about our time, science fiction is simply the best genre to do it in. This is because we're living in a big science fiction novel now that we all co-write together. [...] You write science fiction and you're actually writing about the reality that we're truly in, and that's what novels ought to do. (Robinson 2015)

These being perspicuous observations, Robinson also reflects on the relation of science fiction to the ethical: “‘Science’ implies the world of fact and what we all agree on seems to be true in the natural world. ‘Fiction’ implies values and meanings, the stories we tell to make sense of things.” Robinson points out that it can seem impossible to simultaneously describe the facts of the world as it is and to imagine how it ought to be. Yet, as

Robinson continues, “here is a genre that claims to be a kind of ‘fact-values’ reconciliation, a bridge between the two. Can it be? Well, no, not really—but it can try” (Robinson 2015). A number of contributions in this volume examine how literary representations of science identify connectivities between facts and values and try to balance ethical responsibilities to the real and to the imaginary. More generally speaking, the ten chapters in this collection ask how, why, and to what effects fictional writing about science returns to realist modes and to the past, and examine how twenty-first-century novels, poetry, film, and drama engage with tensions between facts and values, realism and speculation, views of the past and visions of the future.

In Part I, ‘Human Connectivities—Speculations and (Corpo)Realities,’ five chapters engage with the place of the human in a web of relations and a reorientation of fiction’s allegiances to reality and speculation. The authors examine the role of science and technology in questioning and redefining the human from various angles, including consequences of the biomedical sciences, genetic modifications, and new technologies that redefine reading practices. The first two chapters note a shift from focusing on immaterial mental states to exploring effects of science and technology on the material brain, and analyse literary explorations of ways in which science and technology shape human subjectivity, what has been considered its corporeal ‘seat’ in the brain, and our understanding of relations between them. Natalie Roxburgh’s “The Rise of Psychopharmacological Fiction” studies representations of drugs and medications during and after ‘the decade of the brain’ when attention shifted from the subjective experience of the mind to the physical structure of the brain. Roxburgh compares postmodernist novels with those written in a style of new realism, thus engaging on the level of form with a shift in focus from subjective experience to objective materiality, concluding that recent psychopharmacological novels employ and reflect a move towards more realist modes of representation. Roxburgh further uses these texts to explore the idea that science and technology in the twenty-first-century “risk society” (Ulrich Beck) can be grasped with the logic of the *pharmakon* that is both remedy and poison. Chapter 3 by Julius Greve, “Neuropathologies: Cognition, Technology, and the Network Paradigm in Scott Bakker’s *Neuropath* and Dave Eggers’s *The Circle*,” asks about the place of cognition and technology in contemporary fiction and argues for “a conceptual shift from psycho- to neuropathology.” A main reason he identifies for such a shift is the “convergence of today’s technologies of cognition and the network paradigm”: the sense that ‘everything is

connected' that is intricately interwoven with the use of technology. Examining two popular fictional explorations of cognition and technology, Greve's chapter engages with the threats and opportunities of connectivities in the twenty-first century.

The next two contributions turn to the role of scientific theories and new technologies on narrative design and reading practices. Both interrogate the potential role of new media to frame new narratives. Chapter 4, "New Science, New Stories: Quantum Physics as a Narrative Trope in Contemporary Fiction" by Kanta Dihal, focuses on how texts use theories in quantum physics to challenge the concept of identity and open new possibilities of narration, focalisation, plot, and structure. Comparing printed texts with the iOS app *Arcadia* (2015) by Iain Pears, Dihal speculates that the new media provide opportunities for further narrative innovations. Where this chapter concludes that the potential of new media, for example for interactive narratives, has not been fully explored in narratives engaging with quantum physics, the following contribution examines the close connections of technology and changing reading practices in digital poetry. In Chapter 5, "Digital Technologies and Concrete Poetry: Word, Algorithm, Body," Paola Carbone discusses digital poems that reconfigure the main features of concrete poetry and draw attention to reading as an active, sensual process. Identifying a new focus on the physicality of text and on the inclusion of the human body in digital poetry, Carbone's contribution shows not only that technology disconnects us from material reality when it "recede[s] behind the computer screen" (Lea 2017, 19) but that it can also create new connectivities between body and text.

The final chapter in this section, Pia Balsmeier's "Towards a Posthumanist Conceptualization of Society: Biotechnology in Margaret Atwood's *MaddAddam* Trilogy and Ruth Ozeki's *All Over Creation*," refocuses human connectivities explicitly onto the notion of the 'human' and its ontological and ethical limits by exploring the role of biotechnology in the conceptualisation of collective identity as a (post)human(ist) society. Following a careful mapping of different currents in thinking about the posthuman, Balsmeier focuses on fictional texts from North America that explore how the most widespread form of biotechnology, namely genetically modified food, affects human identities. Analysing novels by Atwood and Ozeki, Balsmeier examines how anthropocentric and essentialist views on identity, race, gender, and family can be overcome by more valuable connectivities based on elective affiliations.