

Narrative Complexity and the Case of Pfitz: An Update for the ‘Systems Novel’

TOON STAES

Abstract. Recent narrative studies of complexity theory have shown that so-called ‘emergent complexity’ does not accommodate to narrative form. Complexity theory is an interdisciplinary field of study that researches how large-scale phenomena emerge from simple components without the guidance of a plan or a controlling agent. Emergence happens by chance, through decentralised interactions at lower levels. Its lack of clear causal chains makes the process difficult to conceptualise in narrative so this article turns to a fictional narrative to demonstrate how complexity theory has trickled down into contemporary literature: the historical novel *Pfitz* (1995) by Scottish novelist and theoretical physicist Andrew Crumey. While there have been a spate of publications on complex narratives in film studies, literature studies has lagged behind. As a counter, the article revives Tom LeClair’s notion of the systems novel (1987, 1989) as one useful model for thinking about narrative complexity in prose fiction. I first turn to LeClair’s definition of the systems novel and bring it up to date with recent discussions of complexity theory, then turn to Crumey’s novel to illustrate how *Pfitz* imitates the logic of complex systems through its looping structure, its interconnectedness, and its thematic insistence on chance and necessity.

Keywords: complexity theory; narrative theory; systems novel; Andrew Crumey; literature and science

In March of 1997, at the University of Illinois’s computer science department, the American novelist Richard Powers and the French sociologist Bruno Latour delivered a speech at an event that celebrated the birth year of HAL-9000, the semi-conscious – and eventually murderous – computer in Stanley Kubrick’s film *2001: A Space Odyssey* (1968). Powers and Latour staged their talk as a Turing test. Both pretended to read some thoughts they had been sharing through e-mail in the runup to the event, and it was the task of the audience to decide whether these were really their words and not, for instance, those of a language-processing machine. According to Alan Turing’s original test of 1950, if a person could have a lengthy conversation with a machine without being able to distinguish its answers from those that a human being might give, the

machine had shown that it can think, even if its thinking differs significantly from ours. Powers and Latour turned that premise on its head. Since, at the bottom-most level, our inner lives emerge from electrochemical processes operating on inanimate matter, perhaps we shouldn't ask if machines can pass for minds. Perhaps minds are machines, too. As Powers put it: "Something in the way consciousness is structured seems to want to separate thoughts from the maelstrom of the body that has brought those thoughts to life" (184). Herein lies the catch of the Turing test, he added, and the paradox implicit in fantasies of mind-like machines such as HAL. In the jump from micro- to macro-level, from nerves and neurons to selves and souls, the mechanisms that underlie our thinking somehow give way to "that need to see ourselves as something more than merely 'mechanistic'" (Powers and Latour 1998: 184).

The speech has not found an audience much wider than those in attendance at the time, but "Dialogue in Honor of Hal" does stand as a parable of sorts for what I take to be an important topic in contemporary science *and* literature, also a topic at the core of my article. In essence, the dialogue asks how beauty and feeling and depth arise from the unthinking, unfeeling stuff of the world. What is a self, and how can the self emerge from selfless matter? The same question has become something of a staple in the branch of science that since the 1980s has been called complexity theory, a multidisciplinary field of study which investigates how large-scale and intricately organised phenomena emerge from simple elements without a plan or a guiding authority. The living organism and the neurology of thought, for instance, but also other self-organising systems ranging from ant trails to market fluctuations and the growth of cities, all come into being through many local interactions that produce a higher-level momentum, a pattern in time that subsumes its individual components. Each piece of the pattern – a neuron, an ant, a buyer or seller – only responds to its immediate environment. None have a leading role in the larger behaviour of which they are part. Yet consider the pieces together, and the behaviour of the whole will be much more sophisticated than can be predicted from the parts alone. The result, as complexity theorist Melanie Mitchell puts it, is a "complex system", a structure "in which organized behavior arises without an internal or external controller" (13).

Emergent complexity is one of the most awe-inspiring notions in science today. At the same time, as with many notions that blur the lines between disciplines, the process itself is difficult to conceptualise. Recent work in narrative theory has shown, for instance, that complex-systemic behaviour cannot be represented in narrative form without significant distortion (Abbott 2003, 2008; Grishakova & Poulaki 2019; Walsh 2018). This article extends the debate on complexity in narrative by illustrating how complexity theory trickles down

into fictional narratives. I turn to one example in particular: the short historical novel *Pfitz* (1995) by the Scottish writer Andrew Crumey, a novelist who – much like Richard Powers – transposes concepts borrowed from recent science into the domains of fiction. *Pfitz* centres on complexity theory, which the novel’s closing lines emphasise: “Emergent complexity, bear us aloft!” (164). But *Pfitz* is not just *about* complexity, it is also *narratively complex*. That is, as I will demonstrate below, it integrates ideas taken from complexity theory in both its form and content.

I take as my model here the ongoing debates about narrative complexity in film studies, where complexity theory has already made a significant impact, introducing such terms as “the complex film”, “the network film”, “the hub-and-spoke-film”, or “the modular narrative film” (Poulaki 2014; Simons 2014). While literature studies seem to have lagged behind, my aim is not to introduce a new term, but to revive an older critical term, ‘the systems novel’, introduced by the critic Tom LeClair for a type of novel that weaves its plot around systems dynamics (1987, 1989). In what follows, I first expand on its original definition and bring it up to speed with recent discussions about complexity in narrative theory. I then turn to a discussion of *Pfitz*, in which I focus in particular on the novel’s complex structural elements: its use of metalepsis, its looping structure, and the different causal relations between its main narrative and its two nested narratives. Doing so, I argue that Crumey’s novel imitates a complex system, in that it puts significant strains on one of our key interpretative strategies as we progress through a plot: our wont to predict what will happen next.

Complexity and the ‘Systems Novel’

Systems novels are complex affairs. Tom LeClair first coined the term in a study of Don DeLillo (1987), and expanded upon it later to cover a range of post-modernist novels published in the US in the 1970s and 1980s, from Thomas Pynchon’s *Gravity’s Rainbow* (1973) to John Barth’s *LETTERS* (1979) and Ursula Le Guin’s *Always Coming Home* (1985). These are typically long and dense novels that also engage with contemporary science, and which stand out for their intricate composition and their intertwining of various, often ambiguous, types of narration. Rather than straightforward narratives that progress towards a resolution, systems novels are characterised by what LeClair called their “informational density”, which they put forward in “multilayered, digressive, and looping structures” (LeClair 1989: 15). In systems novels, meaning emerges in narrative relations rather than through causal-chronological chains of events: we read them *linearly*, but we make sense of them *spatially*, fixing our attention on the relationships between the text’s many cross-references and

allusions. In *The Art of Excess* (1989), LeClair argued that it is through their interconnected structure that systems novels imitate “how orders and forms in the world (and not just in the artistic text) can arise out of seeming chaos” (21). Hence the name “systems novel”. These books mimic the dynamics of natural systems, or complex ensembles composed of interdependent elements (LeClair 1989: 6–18).

LeClair mainly used the systems paradigm as a source of plot and metaphor in his discussion. Perhaps this loose conceptualisation helps explain why the term has since lost its traction.¹ However, I would argue that if we shift our focus to narrative design, we can distil a number of features that make the term “systems novel” a productive concept to leverage the issue of narrative complexity in literary fiction – similar to the concept of the complex film in film studies. Maria Poulaki writes on “the complex network film”, for example, that such films “derive their dynamics from connections between a multiplicity of autonomous agents and the different diegetic levels produced by these relations”, specifically, the micro-level of characters and events, the mid-level of their complex constellations, and the macro-level of the film’s extra-diegetic organisation (393). I would argue that a similar dynamic characterises the systems novel. Here are some of its defining features – a list that applies as much to the novels in LeClair’s corpus as it does to Crumey’s *Pfitz*: systems novels feature multiple nonlinear and fragmented narrative strands that gradually fix the reader’s attention on a network of relationships; they braid together different perspectives and narrative voices, none of which is more important than the others; they often feature a large cast of characters; and they display what I would call “distributed causality”, moving from lower-level narrative events to higher-level patterns. As systems novels progress, alternating between parallel plots and disparate storylines, they prompt readers to shift their focus from the particular and the local to the general and the global, in order to perceive the emerging patterns that unfold.

¹ Other contributing factors include LeClair’s corpus of systems novels, which mainly consist of canonical postmodernist fiction, and his use of the terms “excess” and “mastery”, with which LeClair implied that systems novelists exceed the literary conventions of their time (LeClair 1989: 1-5). An example of the former: best-selling novelist Jonathan Franzen contrasted himself with postmodernists such as Pynchon, Barth, or William Gaddis by writing that he is emphatically *not* a “really smart, really angry, really forbidding Systems writer” (246). An example of the latter: in an otherwise thorough discussion of what he calls “the maximalist novel”, Stefano Ercolino moved on from LeClair’s definition by focusing on its excessive and masterful connotations, pushing its engagement with systems science generally to the side (2–7).

Pfitz makes for an interesting test case, not least because its author, Andrew Crumey, studied nonlinear dynamics as a postdoctoral researcher in the 1980s – as the novel’s cover flap indicates. It also makes for an *idiosyncratic* systems novel, since, at a mere 164 pages, its length falls well short of the baggy monsters in LeClair’s corpus. Stephen Burn writes that *Pfitz* relies “more thoroughly on the *mise-en-abyme*, on *synecdoche*” than its American relatives – encyclopaedic novels such as Pynchon’s or Barth’s – yet it still revolves around “the notion of the encyclopedic text” (441). Burn’s point is apparent from the very set-up of the novel. In essence, *Pfitz* is a novel about *mapping*, or the quest to map a city in which all knowledge lies contained, a city that exists only in the minds of its creators: “the City as Encyclopaedia” (14). The map, in the novel, acts as a metaphor for “the fulfilment of an impossible dream”, an explanation of the world, “a rationalization of its hopeless confusion, in which everything is disentangled” (126). But rather than a disentanglement, or *dénouement*, *Pfitz* ends up “wrapped in cross-plotting” (161). It takes complexity as its core.

In a series of essays that set the benchmark for narrative discussions of complexity theory, H. Porter Abbott has argued that the idea that emergent behaviour comes about through decentralised interactions at lower levels jars with our need to see in such behaviour the operations of a controlling force or pace-maker (2003, 2008). Abbott points to reader-oriented studies of narrative that show that human beings have a cognitive bias towards “the clarity of linear narrative”, which explains, for example, why some people prefer a “narrative of centralised control” such as creationism over a tangled, complex idea like the theory of evolution by natural selection (“Evolution” 143). The problem with emergent complexity, then, is that we should think of it as “less a linear narrative and more an interconnected web, growing increasingly dense” (Johnson 40). Whereas we might naturalise any type of behaviour in terms of sequences of events, emergence challenges this predisposition because of its massive distribution of causal agents, which often interact only by chance. I explain below how complex causality propels Crumey’s novel, but the fact that *Pfitz* plays with the notion of complexity in both its form and content has not gone unnoticed. In *The Moment of Complexity: Emerging Network Culture* (2001), for example, cultural critic Mark C. Taylor devotes a few short paragraphs to *Pfitz* to argue that “*Pfitz* is not just *about* emergent complexity, but is a brilliant enactment of it” (151).

Even within complexity theory itself the concept “emergent complexity” is still very fuzzy, which explains why claims such as Taylor’s could sound appealing to literature scholars.² To say that a novel acts as a complex system,

² Melanie Mitchell points out, for instance, that no single science of complexity nor a single complexity theory exists yet, and neither is there a cross-disciplinary consensus

however, stretches the analogy too far. The ground rule of emergence is that complex behaviour comes about without the help of a controlling force. Emergence remains unpredictable. A novel, by contrast, springs from the mind of one (or several) authors, its topics and themes have been carefully selected, and – with the exception of hypertexts or experimental texts in the vein of the Oulipo collective – it will contain the same string of letters no matter how many times we read it. However, as Marie-Laure Ryan writes, the comparison between written narrative and complex systems becomes much more productive when we move down to the level of the plot: authors control their characters from the top down, using them to pursue their own artistic ideas, but “within the fictional world there is no such controlling instance” (33). Ryan even suggests that the “aesthetic success” of a literary narrative depends on its ability to give the reader the impression of an emergent, bottom-up system on the plot level (34). Crumey’s novel makes this duality between top-down author-text relations and bottom-up plot systems visible. It does so in part because it can be seen as a novel about *authoring* – both in the narrow sense of authoring a text, and in the wider sense of constructing an immersive world.

Pfitz moves back and forth between a frame narrative and two nested narratives. In the frame narrative, set in the eighteenth century, an unnamed German prince is obsessed with designing imaginary cities. He never builds them, he just maps them. His current project will be his crowning achievement: Rreinstadt, a city mapped to such perfect scale that it “would provide an exposition of the complete range of human knowledge as currently understood” (14). Practically everyone in the principedom gets involved in the mapping of Rreinstadt. Cartographers chart its streets and sketch its buildings, biographers write and cross-reference the lives of its citizens, accountants calculate its economy, physicists model its weather, and so on. At the centre of the map are a museum and a library, two interconnected structures that act together as “a kind of brain” (17). They feature displays and books on all known natural organisms and cultural artefacts, as well as a great many more on fantasy items (such as a “natural history of unicorns” or a “geometry of round squares”). Since their collections also hold the city’s own maps and plans, they give Rreinstadt “an awareness of itself”, an image of itself contained within itself

about some of its central terms – as is the case with many new scientific fields (14, 301–2). In the early 1990s, N. Katherine Hayles’ two monographs on “orderly disorder” in contemporary literature and science inspired widespread attention among comparative literature scholars for topics related to complex dynamics and chaos theory (Hayles 1990, 1991). In these early studies, complexity and its close relative, chaos, mainly served as productive metaphors to argue that the sciences and the arts essentially belong to the same “cultural matrix” (Hayles 1990: 4).

(16). Rreinstadt, in short, evolves as a complex system. All those who work on it are “familiar only with those aspects in which they [have] direct involvement” (15), but considered as a whole, Rreinstadt grows, adapts, and transforms over time.

The two nested narratives of *Pfitz* are situated *inside* the map of Rreinstadt. One tells the story of the servant Pfitz and his master, Count Zelneck, passing through Rreinstadt for one of its holiday festivals. The other features fragments from one of the books in Rreinstadt’s Library, *The Aphorisms of Vincenzo Spontini*, which consists of observations and self-reflexive comments by a narrator who seems on the verge of a complete breakdown. With the introduction of these intersecting stories, the novel no longer just *represents* complexity, its representation becomes *narratively complex*. The different narrative levels in *Pfitz* do not overlap (i.e. they don’t share characters or events), but together they behave as a sort of feedback cycle: plot events from the frame narrative influence events in the two nested narratives, which in turn change the course of the plot in the frame narrative. Because of this looping structure, it becomes increasingly difficult as the novel progresses to interpret events in a linear, causal-chronological way. Below, I explore the two embedded narratives and their relation to the frame narrative to illustrate my point.

Between Chance and Necessity

As Karin Kukkonen has recently argued, readers of fiction engage in a practice known as “predictive processing” as they make their way through a plot. That is, they make inferences about the probabilities inherent in the narrative itself, use their inferences to develop different mental models of what is likely to happen next, and adjust these models as new plot events introduce new probabilities, confirm their predictions, or pair down their expectations (Kukkonen 2020: 16). In the case of *Pfitz*, the feedback loop between the different narrative levels puts considerable strain on that process. Readers can still hypothesise about what will happen next, but the novel defies prediction. For instance, *Pfitz* dives into the story of its eponymous character not because the logic of the narrative dictates it, but by a fluke. In his attempts to impress a female colleague, Schenck, one of the cartographers in the novel’s frame narrative, stumbles upon a map with an erased and hastily redrawn figure, named Pfitz. No other records exist of Pfitz – an oversight that threatens to upend *all* the maps of Rreinstadt – so Schenck decides he now has to write the story of Pfitz himself. Of course this set-up demonstrates the loopholes inherent to the encyclopaedic project at the heart of the novel. In a dynamic, interconnected, complex system such as Rreinstadt, chance will intervene.

Whereas the novel's primary level is governed by order and logic, with the map as its central metaphor, all events in Schenk's embedded narrative of the servant Pfitz seem to depend purely on chance. As Pfitz himself puts it: "Everything in this world happens by accident" (37). Rather than some overarching causal project that drives the plot, there is no progression to speak of here, and the story that purports to tell how Pfitz and Count Zelneck arrive in Rreinstadt keeps getting bogged down in digressions. The lack of progression is exacerbated by frequent intrusions by an omniscient authorial narrator – the first of which sums up the flow of his narrative: "The author says that if his story is to resemble the world in any way at all, then it must be formless and without logic, proceeding randomly from one moment to the next. Then, gradually, pattern will emerge which may or may not indicate events, ideas, or actions" (38).

The rambling story of Pfitz brings two important intertexts to mind, both written in the eighteenth century, the temporal setting of Crumey's novel. The disruptive author-narrator, for example, evokes Laurence Sterne's *Tristram Shandy* (1759–1767), and readers familiar with Sterne will recognise a shared running joke. As with Sterne's *Tristram*, Crumey's Pfitz insists that he will explain "how it was that [he] came to be born" (42, 133), and like *Tristram*, Pfitz keeps losing himself in lengthy asides instead. A more direct influence, however, is an "admiring imitation of Sterne" (Furbank 1992: 303), Denis Diderot's *Jacques le fataliste* (1796). As Stephen Burn has noted, Pfitz and Count Zelneck invert Diderot's figures of Jacques and his Master, as they riff on the themes of chance and determinism (441–2). Diderot's Jacques interprets everything that happens to him as if it "is written up above", according to some predestined plan (29). Pfitz, whose biography in the novel is quite literally written by a character one narrative level *above* him, represents Jacques' opposite, someone for whom all events, even his own birth, "happened by accident" (41).

Pfitz proselytises about chance. The novel's second embedded narrative, the *Aphorisms of Vincenzo Spontini*, channels Diderot's Jacques in a more direct manner. In clear contrast to Pfitz, Spontini explicitly imagines his life as someone else's text: "I am not the author of my actions, and need feel no remorse. I am instead a reader – one amongst many. The life which I imagine to be my own is simply a text provided for my diversion" (57). The chapters that involve Spontini are among *Pfitz's* most mysterious passages. In them, we encounter two distinct narrative voices, both ostensibly Spontini's: one is italicised, in which a ruminative narrator describes a Gothic environment (an observatory, an astrologist's lab, a dark courtyard) and vaguely hints that he seeks revenge for his wife's affair with a servant; the other is in plain text, in which the narrator – to all appearances the same one, but older –

self-consciously comments on the italicised text from inside an executioner's cell, except, he doesn't recognise the words from his past as *his* anymore: "I read the words which they send me, these thoughts which purport to be mine, and yet seem strange to me" (86). The trope of the character becoming aware of his or her own fictionality is a familiar postmodernist device, but in *Pfitz*, Spontini's metaleptic moments have repercussions on all narrative levels. On the primary level, the frame narrative, *The Aphorisms of Vincenzo Spontini* exists only in Rreinstadt's library. Like all other books collected in the library, its real authors are the mappers of Rreinstadt. Spontini himself seems all-too-aware: "I, Vincenzo Spontini, am a colony of writers; a city of ideas. My work ... is an amalgam of the various tastes, styles and interests of those whose ideas would seek to flow into the space which my literary identity is to occupy" (121). The causal principle at work in the *Aphorisms*, then, is not chance, but what complexity theorists refer to as "downward" causation – a form of causality "in which an event at one level ... can cause events at other levels to happen" (Hofstadter 1979: 709).

In systems that display downward causation, the organisation of the whole dictates the function of the parts. A good example would be the neurology of the mind. At the smallest scale, all the neurons in a human brain look and act the same. Mental properties such as consciousness or free will do not exist at the neural level. Rather, they emerge from the many interactions between vast clusters of neurons divided over the brain's subsections. In other words, consciousness or free will are high-level properties that determine the behaviour of the neurons from which they emerge. In his Pulitzer-winning book *Gödel, Escher, Bach* (1979), cognitive scientist and AI specialist Douglas Hofstadter describes downward causation as follows: "My belief is that the explanations of 'emergent' phenomena in our brains ... are based on a kind of Strange Loop, an interaction between levels in which the top level reaches back down towards the bottom level and influences it, while at the same time being itself determined by the bottom level" (709).³

A similar dynamic is at work in Crumey's novel. Once more, Schenck acts as the mediator. We descend into Spontini's *Aphorisms* when Schenck finds Spontini's name crossed out on the back of the map on which he saw Pfitz's hastily drawn figure. Schenk heads to the "Literature Division" (48), the division responsible for Rreinstadt's Library, and consults Spontini's book

³ Hofstadter draws on the work of neuropsychologist Roger Sperry here, one of the first scientists to articulate the principle of downward causation (Hofstadter 1979: 710). The pioneering complexity theorist John Holland has since referred to Hofstadter's *Gödel, Escher, Bach* as a textbook explanation of emergent complexity (11).

for further clues. Schenck's impression of *Aphorisms* very much aligns with Hofstadter's take on the mind as an emergent phenomenon: "The book seemed to take as one of its themes ... that a personality, an identity – a mind even – can somehow emerge from parts whose co-operation is almost accidental" (126). But perhaps more important than the content of the *Aphorisms* is that the book, like all books in Rreinstadt, is itself the product of a Strange Loop.

The literature collected in Rreinstadt's Library is written as follows: once the biographers in the frame narrative conclude that one of Rreinstadt's citizens has literary aspirations, they send his or her biography to the Literature Division, where a group of writers produce a book inspired by the biography. Each of these writers first writes a text on his or her own, after which they synthesise their combined output into something that "emerges [as] the common factor in all of [their] work" (81). With that process completed, the Literature Division then sends the book back to the Biography Division, which gives the biographers in turn a fuller impression of the person whose biography they are writing. As one writer puts it: "Our work created his life, and was at the same time created by what we knew of his life" (115–6). The cycle feeds back and reinforces itself: the biographers' new work influences the next book, which then loops back to influence the next parts of the biography, and so on. What "emerges" from the process is a fuller picture of Rreinstadt itself, something that, to quote one of the novel's Librarians, "is greater than the sum of its parts. ... It's a magical process, difficult to explain, but it always happens" (81).

As I have explained earlier in this article, emergence cannot be traced back to a single cause: it seems as if it just *happens*. The Librarian's words above echo the feelings of wonder and awe routinely expressed by complexity theorists when they talk about their research. When asked what it means "to say that the whole is greater than the sum of its parts", complex systems scientist Dooyne Farmer replied: "It's not magic. ... But to us humans, with our crude little human brains, it *feels* like magic" (Farmer in Waldrop 1992: 288). Theoretical biologist Stuart Kauffman, another pioneer in the field, calls emergence a natural force that is "so stunning, so overwhelming, so worthy of awe, gratitude and respect, that it is God enough for many of us" (6). The writers in *Pfitz's* frame narrative share that sense of excitement: "I can't wait to see the finished book. None of us has the slightest idea how it will turn out" (50). Readers of *Pfitz* dabble in the same uncertainty. Downward causation drives the embedded narrative and the frame narrative forward, until eventually both narrative levels begin to bleed into one another.

Rreinstadt evolves as a complex system. *Pfitz* throws a wrench in that system when one character tries to control the process. Near the end of the novel, the frame narrative reveals that one of the writers of Spontini's *Aphorisms*

had begun identifying with Spontini – who suspects his wife of adultery – and killed a colleague in a fit of jealousy. He erased the traces of his crime by staging a murder plot in the *Aphorisms* and making it seem as if his dead co-writer had been losing his mind. Of course, intervening in the complex map of Rreinstadt sets in motion a cascade of events, whereby, eventually – through all sorts of machinations – Spontini’s biographers had no choice but to make Spontini murder his wife in Rreinstadt, together with the adulterer, who turns out to be Count Zelneck. In the frame narrative, the writer, still identifying with Spontini, had tried to cover Spontini’s tracks by erasing the only victim who connects Spontini to the double murder – the wife – from the map in which these murders happened. Next to the smudge left on the map by his pencil eraser he wrote the German word for puddle, “Pfütze”, which Schenck would later misread as “Pfitz”, the mistake that sets the novel’s plots in motion (153).

The “perfect” map of Rreinstadt might then stand as a metaphor for “a clarification of the world ... in which everything is disentangled” (126), but events in *Pfitz* do not disentangle: they interconnect and reinforce one another. One mistake has unpredictable yet unavoidable consequences on all narrative levels. The looping structure of the novel demonstrates how chance events develop necessary outcomes – a hallmark of emergent complexity, as Nobel-winning biologist Jacques Monod wrote in *Chance and Necessity* (1970). In Monod’s own field, the objective, unchanging, physical laws of nature work on the macroscopic level, the level of the organism, which Monod called “the realm of necessity” (1972: 114). But the vast diversity of all life stems only from accidental errors at the microscopic level, the level of DNA, the realm of chance – meaning, in other words, that “chance alone is at the source of every innovation, of all creation in the biosphere” (ibid. 110). Life exists on the cusp between chance at one level and determinism at another.

At a general philosophical level, complexity theory casts the living world and everything in it as one massive and interconnected network, in which organisms coevolve in endlessly surprising ways by adapting to each other. We, too, are complex systems that are more than the sum of our parts (our atoms, DNA molecules, neurons, ...), and we, too, are the component parts of larger complex systems (our economies, ecosystems, planet, ...). In Crumey’s novel, the embedded narrative of *Pfitz* unravels as a glitch in the system, the consequence of an error in the mapping of Rreinstadt. But its metaleptic narrator, an inversion of Diderot’s Jacques the fatalist, suggests that complexity does leave us with a degree of freedom. There are some, he writes, “who believe that the world itself is no more than a great book, written up above by an unseen hand”, and there are others – like Pfitz – for whom nothing happens except by chance. But there is a third option, between chance and necessity: “Still others

assert that the books themselves are being written as we speak, and their plot is something over which we can have some influence. It is a matter of debate within that particular school, whether the way in which those books turn out was already dictated by some higher book, or whether indeed there may be an infinite hierarchy of books and libraries governing the fate of coincidences, the coincidences of fate, the fate of fates, or the coincidences of coincidences” (43).

It is through its openness and interconnectedness, its looping structure, its thematic riffs on chance and necessity, and of course its familiarity with science that *Pfitz* is a novel that imitates the logic of complex systems – in other words, a “systems novel”.

Wrapping up, I see the “systems novel” as more than an umbrella term for postmodern mega-novels of the 1970s. It is one genre in a long chain of genres that wrestle with questions of complexity. How does *much* come from *little*? How can the blind forces of nature produce life, consciousness, organisms, and ecosystems? We know from the recent interest in complexity among narrative theorists that emergent complexity falls into the category of “representationally hungry problems”, or problems that mark the boundaries of our understanding (Spolsky 2010: 50). Representation-hungry problems are hard to comprehend and hard to represent, and the fact that they return in different literary forms throughout time illustrates a continuing urge to understand and “re-represent” them (Spolsky 2010: 50–7).⁴ Earlier links along the chain of novels that grapple with complexity include the Victorian triple-deckers that tried to assimilate Charles Darwin’s evolutionary theory “within the subtle enregisterment of narrative” (Beer 1983: 4). Even older examples include *Pfitz*’s intertexts, *Tristram Shandy* and *Jacques le fataliste*, two playful novels that explore the causal agency of chance, a relatively new idea that begins to appear in both science and literature “toward the end of the Enlightenment” (Richardson 1997: 20). Systems novels such as *Pfitz* – or, for that matter, any of the novels in LeClair’s corpus of systems novels – are one more link in that chain. *Pfitz* ends, by necessity, at the embedded level of *Pfitz*, after the death of Count Zelneck, when Schenck writes a final chapter that wraps up the story and erases *Pfitz* from the annals of Rreinstadt. Master and servant reach the edge of the universe and emerge

⁴ For Ellen Spolsky, for example, the insistence of 18th- and 19th-century novel on marriage themes, the Romantic concern with non-institutional religion, or the post-war German novel’s thematisation of war and guilt are all explorations of old subjects that have become newly problematic. In all cases “we should assume that the authors and interpreters involved are gnawing away at a hard bone; they are trying to make order in a corner of our minds and also in our society on a subject that needs the forming and organizing powers of dramatic, pictorial, or narrative art, but is also particularly resistant to attempts at such organization or clarification” (51).

from its farthest side in a “great Library”, in which “every conceivable thought, impulse or emotion is given expression” (162). The narrator gets the final word: “I see now that there is no Author, or else there are many Authors, and we ourselves are fictions whose apparent complexity and subtlety of meaning is something which has emerged from simple matter.” (164)

Toon Staes

toon.staes@uantwerpen.be

University of Antwerp / University of Tartu

BELGIUM / ESTONIA

Works Cited

- Abbott, H. P. 2003. Unnarratable Knowledge: The Difficulty of Understanding Evolution by Natural Selection. – D. Herman, ed., *Narrative Theory and the Cognitive Sciences*. Stanford: Center for the Study of Language and Information, 143–162.
- Abbott, H. P. 2008. Narrative and Emergent Behavior. – *Poetics Today*, 29 (2), 227–244. <https://doi.org/10.1215/03335372-2007-024>
- Beer, G. 1983. *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*. London: Routledge.
- Burn, S. J. 2012. Reading the Multiple Drafts Novel. – *MFS: Modern Fiction Studies*, 58 (3), 436–458. <https://doi.org/10.1353/mfs.2012.0059>
- Crumey, A. 1995. *Pfitz*. Sawtry: Dedalus Books.
- Diderot, D. 1986. *Jacques the Fatalist*. London: Penguin.
- Ercolino, S. 2014. *The Maximalist Novel: From Thomas Pynchon's Gravity's Rainbow to Roberto Bolaño's 2066*. New York: Bloomsbury.
- Franzen, J. 2002. Mr. Difficult. – *How to Be Alone*. London: Harper Collins, 238–269.
- Furbank, P.N. 1993. *Diderot: A Critical Biography*. 1992. London: Minerva.
- Grishakova, M., Poulaki, M. 2019. Introduction: Narrative Complexity. – M. Grishakova, M. Poulaki, eds., *Narrative Complexity: Cognition, Embodiment, Evolution*. Lincoln: University of Nebraska Press, 1–26. <https://doi.org/10.2307/j.ctvhktjh6.6>
- Hayles, K. N. 1990. *Chaos Bound: Orderly Disorder in Contemporary Literature and Science*. Ithaca: Cornell University Press. <https://doi.org/10.7208/chicago/9780226230047.001.0001>
- Hayles, K. N., ed. 1991. *Chaos and Order: Complex Dynamics in Literature and Science*. Chicago: The University of Chicago Press. <https://doi.org/10.7208/chicago/9780226230047.001.0001>
- Hofstadter, D. 1999. *Gödel, Escher, Bach: An Eternal Golden Braid*. 1979. Twentieth-Anniversary Edition. New York: Basic Books.

- Holland, J. 1995. *Hidden Order: How Adaptation Builds Complexity*. New York: Helix Books.
- Johnson, S. 2001. *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*. New York: Scribner.
- Kauffman, S. A. 2008. *Reinventing the Sacred: A New View of Science, Reason, and Religion*. New York: Basic Books.
- Kukkonen, K. 2020. *Probability Designs: Literature and Predictive Processing*. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780190050955.001.0001>
- LeClair, T. 1987. *In the Loop: Don DeLillo and the Systems Novel*. Urbana: University of Illinois Press.
- LeClair, T. 1989. *The Art of Excess: Mastery in Contemporary American Fiction*. Urbana: University of Illinois Press.
- Mitchell, M. 2011. *Complexity: A Guided Tour*. Oxford: Oxford University Press.
- Monod, J. 1972. *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology*. London: Collins.
- Powers, R., Latour, B. 1998. Two Writers Face One Turing Test: A Dialogue in Honor of Hal. – *Common Knowledge*, 7 (1), 177–191.
- Poulaki, M. 2014. Network Films and Complex Causality. – *Screen*, 55 (3), 379–395. <https://doi.org/10.1093/screen/hju020>
- Richardson, B. 1997. *Unlikely Stories: Causality and the Nature of Modern Narrative*. Newark: University of Delaware Press.
- Ryan, M.-L. 2019. Narrative as/and Complex System/s. – M. Grishakova, M. Poulaki, eds., *Narrative Complexity: Cognition, Embodiment, Evolution*. Lincoln: University of Nebraska Press, 29–55. <https://doi.org/10.2307/j.ctvhktjh6.7>
- Spolsky, E. 2010. Narrative as Nourishment. – F. L. Aldama, ed., *Toward a Cognitive Theory of Narrative Acts*. Austin: University of Texas Press, 37–60.
- Simons, J. 2014. Complex Narratives. – W. Buckland, ed., *Hollywood Puzzle Films*. Oxford: Taylor and Francis, 17–34.
- Taylor, M. C. 2001. *The Moment of Complexity: Emerging Network Culture*. Chicago: The University of Chicago Press.
- Waldrop, M. M. 1992. *Complexity: The Emerging Science at the Edge of Order and Chaos*. New York: Simon & Schuster.
- Walsh, R. 2018. Sense and Wonder: Complexity and the Limits of Narrative Understanding. – R. Walsh, S. Stepney, eds., *Narrating Complexity*. Berlin: Springer, 49–60. https://doi.org/10.1007/978-3-319-64714-2_5