Curating Simulated Storyworlds

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CURATING SIMULATED STORYWORLDS

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Case Study: *Oilfurnace*

Let us finally return to the thesis of this section: emergent narrative works like nonfiction.[21] To ground this discussion, we will consider the case of *Oilfurnace* (2010), a narrative comic by Tim Denee that recounts the emergent events of a *Dwarf Fortress* [17] gameplay session. The comic was commissioned by the Australian magazine *PC PowerPlay* and appeared in its June 2010 issue [255]; an excerpt is shown in Figure 3.1.[22] *Oilfurnace* recounts a *Dwarf Fortress* gameplay session that Denee carried out over the course of two or three months [756], and as such it is clearly a work of emergent narrative—and more particularly of curationist emergent narrative, as I will emphasize in Chapter 5.

Oilfurnace begins by explaining that the titular Oilfurnace is a dwarven colony established on a place called Dread Island, a barren isle in the region of The Fatal Forests, by the decree of a dwarven king in the (dwarven) year 1050. The colonists are The Fatal Forests Trading Company, a troupe of seven individuals of varying specializations—four are miners, the others are multiskilled—who are led by a character named Ast Akrulikal. Prior to Oilfurnace, four earlier colonies had been attempted at the site, but each ended in disaster: zombie gorillas, thirst and starvation, zombie elephants, and flood.[23] From this background, the comic proceeds to tell the story of the colony in terms of four distinct periods in its history (each taking up its own page): The Foundation, The Rise, The Golden Age, and The Fall.

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[21]My argument in this section was bolstered by conversations with Max Kreminski and Jason Grinblat, who each take a similar stance on these issues.

[22]The entire comic is freely available online at `https://www.timdenee.com/oilfurnace` [256]. Prior to *Oilfurnace*, Denee produced a similar comic called *Bronzemurdered* [254], and he is also the illustrator of *Getting Started With Dwarf Fortress* [1281]. Many more stories recounting *Dwarf Fortress* gameplay are available on the website *Dwarf Fortress Stories* [1287], which is curated by Taran and Trevor Van Hemert.

[23]This narration is an allusion to the emergent narrative of earlier gameplay sessions carried out by Denee in the same simulated storyworld.

Figure 3.1: An excerpt from *Oilfurnace* (2010), a narrative comic by Tim Denee that recounts the emergent events of a *Dwarf Fortress* gameplay session. In this final segment of the comic, the previously thriving Oilfurnace colony opens a gateway to the underworld and faces the consequences thereof. This curated story, I contend, works like nonfiction, particularly in the sense of Hayden White's historiography.

In Denee's narration of the fist period, we learn of the foundation of the colony through an ordered series of discrete events that are recounted in comic panels that each couple an illustration and a sentence or two of descriptive natural language. These pertain primarily to the successful construction of an elaborate shaft allowing access to the rock layer below an aquifer that had brought the demise of two of the earlier colonies (in one it could not be traversed, in the other it flooded). The narration of this period culminates in a miner discovering platinum in the rock layer below the aquifer.

At the beginning of the next period, the dwarves dig into the dry stone beneath the aquifer and carve out a subterranean fortress. From here, industry proceeds—trees are harvested, ore is mined, coal is burnt, metal is smelted—and new migrants arrive at the island fortress by boat. An invasion of undead slugmen and snailmen challenges the fortress, but a militia comprising Ast Akrulikal and a dwarf dubbed 'Batdwarf' (he wears a robe made of bat leather) swiftly disposes of them. More migrants come and so do more invaders, but the militia grows in turn and these challenges are also overcome. A period of starvation ensues, but this is solved by the development of a series of cave farms in which mushrooms are cultivated. At this point, precious metals abound in the fortress and a first mayor is elected. As a final hardship in this period, troglodytes begin to emerge out of the fortress mine shafts, but a series of traps are constructed accordingly. Finally, a shaft is dug deep, into a magma layer in "the bowels of the earth", and the dwarves use this as a garbage disposal. The period culminates, as before, in the discovery of a precious mineral—this time, miners encounter adamantine at the bottom of the magma trash chute.

From here, Denee proceeds to narrate The Golden Age of Oilfurnace. On this page, the explanation is more visual than narrational, illustrating the layout

of the fortress and concerns such as the processes that characterize its steel and adamantine industries (which emerge from the game's *crafting system* [431]). Additionally, we learn that the six surviving members of the previous period's militia have each attained the status of 'legendary killer'—this cohort is now dubbed the 'zombie slayers', as they deal swiftly with a series of zombie hordes. A new generation of dwarves is growing up in the fortress, the population is booming, and an arena for entertainment and training has even been constructed. A foreboding panel at the bottom of the page, however, notes the presence of five *forgotten beasts* [1281, p. 172] in the magma layer below the fortress.

Finally, Denee narrates the closing period in the history of the colony: The Fall of Oilfurnace. Here, he returns to a predominantly narrational style, with ordered event panels; this page is shown in Figure 3.1.[24] The period begins with the fortress mayor demanding, hubristically, that coins be minted out of pure adamantine, which requires miners to dig near the deepest parts of the magma sea below the fortress. Unfortunately, this opens a gate to the *underworld* [283]. From here, the narration tightly reconstructs a rapid series of events that begins with a group of demons pouring out of the gateway to meet the zombie slayers. The demons, Denee explains, are too powerful and too numerous: members of the militia perish, and Batdwarf is forced to sacrifice himself to allow Ast Akrulikal the time and space to retreat from the depths. Miners are ordered to breach the aquifer (to drown the demons), but they panic or die before this can be done. An alarm bell sounds to call for evacuation, and Ast (with no weapon and a broken arm) and six other survivors manage to escape and close the fortress gate behind them. With the dwarves now outside and helpless, a band of zombie slugmen emerge from the dead woods of Dread Island to descend upon them.

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[24]Note that the temporal sequence is made explicit by numbering each panel; this device was also used on the second page.

Only Ast survives the onslaught—"he punches a slugman through the head"—and he retreats to a secure building in the woods. In this secret keep, Ast is shown reading a letter from the dwarven king that reads *Remember: losing is fun* (panels 17–18)—this is the *Dwarf Fortress* community's favorite slogan [1281, p. 2]—and finally he pulls a "self-destruct lever", thereby locking himself safely (but permanently) inside. In a final panel, Ast is shown rotted to bones in the keep, and Denee concludes the tale:

> The entrance to the fortress is blocked by pulling the self-destruct lever. With nothing waiting for him outside the lever-keep, Ast waits for death inside, away from the harsh glare of the overbright. If a dwarf cannot die underground, at least let him die with a roof over his head. A noble end to an ignoble fortress; it is all any dwarf can hope for.

Oilfurnace as Nonfiction

I contend that *Oilfurnace* is a work of nonfiction (or at least works like one). To explore this claim, let us treat the descriptions of nonfiction given above as classification schemes: if they can be applied to *Oilfurnace*, then its status as nonfiction is supported, and from here it is reasonable to extrapolate this characterization to other works of emergent narrative.

First, it is prudent to consider the objections to the very notion of nonfiction that I have outlined above. If Gorgias, taken seriously, is correct, then nothing exists: there is no *Oilfurnace*, no dissertation, no me, no you. If one allows for solipsism, then still I cannot be sure that *Oilfurnace* exists and neither can you. Moving beyond these troubles, we encounter the postmodernist assassination of objectivity. In the case of the artifact at hand, this perspective might lead us to maintain that, in constructing a comic that recounts the emergent events of his *Dwarf Fortress* gameplay session, Tim Denee has produced a work of fiction,

because it impossible to produce an objective account of anything.[25] This is a reasonable view that I accept, but like the various other scholars who were discussed above, I think it is also reasonable to say that objectivity is not a necessary feature of nonfiction. That is, there is an identifiable genre called nonfiction, and it persists in spite of the impossibility of human objectivity. This, again, is the sense of 'nonfiction' that I appeal to in making this argument, and so the postmodern critique is not a showstopper here.[26]

Before moving on, let us consider the postmodernist critique as it would apply to emergent narrative as it more commonly appears: an unfiltered stream of phenomena that transpires over the course of an interaction with a simulation. In Chapter 4, I will build on Espen Aarseth's critique of this approach to emergent narrative (my view: narrative only obtains when the raw stream is curated), but nonetheless it is currently the predominant conception of the form. As such, it is interesting to ponder: are these streams of raw emergent narrative objective? It turns out, I think, that this consideration does not really compute, since it is like asking whether the raw stream of reality is objective—we can only know it through a subjective experience of it, and the artifact of our encounter (whether that be a mental understanding or a work of media) is thus always subjective. In the case of a raw stream of simulated material, we might say that the narrative obtains in the mind of the interactor as the stream transpires, but then the result is clearly subjective. Really, this consideration does not make much sense because it requires us to ignore that such streams lack the narrative structure that characterizes the fiction and 'nonfiction' artifacts that are the subject of the postmodernist critique

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[25]Barthes, in a similar vein, might specifically argue that the sign system of the comic has as its signifieds not the actual characters and material of the Oilfurnace colony and its larger simulated world, but rather simulacra of those entities. That is, the denotational procedure constituted in the composition of any human communication, including a comic, makes objectivity impossible.

[26]To be clear, this is what I mean when I say that emergent narrative 'works like' nonfiction.

(which means we cannot proceed in good faith). This conceptual trouble is an expression of what I view as the fundamental issue with emergent narrative: <mark>raw event streams are not narrative, but for some reason they have been viewed as such in the particular case of simulation.</mark>

Semantic Perspective: *Oilfurnance*'s World

Next, let us consider the *semantic perspective* on fictionality. According to the view articulated by David Lewis, nonfiction obtains when (or to the degree that) a narrative asserts true propositions about real referents. Who are the referents of *Oilfurnace*'s narration? They include characters such as Ast Akrulikal, Batdwarf, and other named dwarves; unnamed characters including the various zombies and forgotten beasts; locations such as The Fatal Forests, Dread Island, the Oilfurnace colony and fortress, and components of the fortress; the named earlier attempts at colonizing Dread Island; and many more. Logical propositions about these entities, then, are asserted through the various storytelling mechanisms employed in the comic: visual images, natural language prose, panel arrangements, and any other technique one might encounter, for instance, in the poetics of sequential art proffered by Will Eisner [304] or Scott McCloud [796] or others [545]. So, are these real referents and true propositions?

This line of thinking ultimately converges on a discussion of the ontology of simulation, and in particular whether simulated entities and events are realer than their counterparts that obtain in conventional fiction. One might contend that a simulated entity is not real because it is virtual, not physical. To this, another might counter that the simulated entity *does* indeed have a physical constitution, one that obtains in the material of the computing machine. This is probably not a great argument, however, because that physical constitution will vary across

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runtime instances, even if the virtual entity remains identical (by some policy for determining isomoprhism).

Alternatively, one could say a simulated entity is not real because it is a simulacrum. But if Ast Akrulikal is a simulacrum, what is the original entity that it represents? Due to the use of world generation in *Dwarf Fortress*—i.e., due to its *roguelikeness* [379]—Ast Akrulikal only exists in the storyworld that is associated with the particular world seed and software version that Tim Denee used in his gameplay session. Thus, Ast Akrulikal is no simulacrum: he is not a human being, or even a being of any sort, but he is something of a particular kind—a *Dwarf Fortress* dwarf—and he exists in his world at the full fidelity of existing as that kind.[27] That is, he could not be more perfectly modeled, just like you could not be more perfectly modeled—you are the perfect representation of yourself, because you are yourself, and the same is true of this character.

One might argue that this does not hold for characters in conventional fiction: the Sherlock Holmes that one encounters in print, for example, is a lossy representation of the pure Sherlock Holmes that existed in the mind of Sir Arthur Conan Doyle, making the former a simulacrum of the latter.[28] Intriguingly, this situation only obtains in roguelike procedural narrative—an approach often taken in works

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[27]More specifically, this kind is a *Dwarf Fortress* dwarf in the particular software version that Denee executed. When Tarn Adams changes game code that affects the representation or behavior of dwarves (or of any part of the gameworld that affects dwarves in any way), then the ontology of the *Dwarf Fortress* dwarf changes. This means that Ast Akrulikal and a dwarf of another version of the game may be of different kinds. As Ian Horswill noted in his feedback on an earlier draft of this thesis, the treatment of simulated entities as being real raises peculiar ethical questions: "If DF dwarves are real, what are the ethics of killing them?" (personal communication, July 28, 2018). I will not dive into this issue here, but for discussion of it with regard to *The Sims* [792], for instance, see this paper by Juyun Kim and Stephen Petrina [579].

[28]Interestingly, since Doyle is dead, one could state that the original is gone, and all that is left is the copy. This calls to mind Jean Baudrillard's writing, in *Simulacra and Simulation* [88], about copies with no (extant) originals. As Noah Wardrip-Fruin noted in his feedback on an earlier draft of this thesis, this argument is made tenuous by the shift in literary studies away from the author (e.g., [77]). Indeed, the argument will fall apart by the end of this paragraph, but I think the idea is still worth mentioning.

of emergent narrative—since authored characters still appear in other kinds of computational media. For instance, my claim about Sherlock Holmes could be applied to the *Façade* character Trip [778], though now the original(s) would exist in two minds (belonging respectively to co-creators Michael Mateas and Andrew Stern). In this way, the argument begins to fall apart. Moreover, even in the case of Ast Akrulikal, another player could access the same storyworld by using the same seed and software version (or Denee himself could, for a second time), and assuming divergent gameplay inputs, the world would proceed differently and Ast Akrulikal himself would likely change as well. Generally, I think it is probably futile to make ontological claims about the realness of simulated entities (and even if realness could be established, issues with objectivity could prevent direct access to the true forms).[29]

Instead of considering the ontology of simulated entities, one might explore an intuition: simulated events seem to *happen* in a way that authored fictional events do not. That is, the stuff of emergent narrative is material that is not authored, but instead emerges out of the complex interaction of authored processes. I am not sure how to construct a formal semantic account of this intuition, since the representation of true propositions referring to nonexistent entities would require a peculiar logic. Instead, I will contend that this intuition, and the feeling

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[29]Again, Barthes's reference illusion comes to mind: perhaps Ast Akrulikal is merely a kind of signified with no referent. I will note also that others have made ontological claims about expressive simulations. Cameron Kunzelman postulates, evocatively, that the system of a videogame constitutes a real, living body that humans live both with and within [624]. Several thinkers have suggested that the gameworlds of massively multiplayer games like *Eve Online* are real worlds [167], though this idea is bolstered by fact that many human interactors pilot characters in its multiplayer networked storyworld simulation. In a distinct but related vein, Stephanie Boluk and Patrick LeMieux describe simulated storyworlds as monuments to the real mechanisms that produce them: "Despite its minimal textual interface, the process of generating this history weighs heavily on the central processing units of most computers. The millions of events logged during world generation are granular enough not only to correspond to the history of the gamespace represented on-screen but also to ultimately historicize the processor cycles of the computer itself" [126, p. 126].

that procedurally generated entities are somehow realer than authored fictional characters, supports a loose idea that emergent narrative works like nonfiction. Whether this is true or not, the notion, when held by an author or reader, supports a particular set of aesthetics—indeed, ontology may be orthogonal to aesthetics, since the aesthetics of a work for an individual depends on her conception of that work.[30] In Section 3.2, I discuss the aesthetics supported by this intuition.

While I find this intuition alone to be powerful, I will now provide a concise logical account of *Oilfurnace* as nonfiction that is rooted in John Heintz's identified features of fictional worlds. As outlined above, Heintz describes fictional worlds as being logically incomplete and logically inconsistent, and thereby he implies a definition of nonfiction as narrative that recounts complete and consistent worlds.

Due to the nature of computer simulation, the simulated storyworlds of emergent narrative are in fact complete and consistent. As an example, let us consider the case of the *Dwarf Fortress* world that *Oilfurnace* recounts—specifically, let us discuss logical *decidability* (whether and how one can identify truths and non-truths) with regard to this world. As the world obtains through the execution of the game's software, a set of facts about the world will be asserted as an unavoidable byproduct of that execution. These facts will pertain to concerns such as entity attributes, the order of simulated events, details of the physical world model, and much more. Some of these facts will be stored in computer memory, which means propositions about the storyworld may be evaluated by querying against this data. As such, the notion of a truth (pertaining to the simulated storyworld) may be operationalized as a fact that can be queried during execution of the game's software (of course, with the seed and software version that

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[30]In my project *Sheldon County*, discussed in Chapter 12, I specifically frame the media artifact as a work of nonfiction (both in the work itself and in supporting materials). Whether that is true or not, it is how I conceive of the work, and by framing it accordingly, listeners will be led to also view it in this way.

indexes that world being used).[31] Note that some truths about the world will not be recorded as persistent facts that are stored in data, because it is not feasible to record all data about the gameworld—we might call these *ephemeral facts*. Nonetheless, even an ephemeral fact qualifies as constituting a truth under this operationalization scheme, because the fact could have been queried in the brief moment that the pertinent data existed in memory. As such, all truths about the storyworld will be rendered in asserted facts as the simulation proceeds. That is, with regard to a simulated timestep t, all truths about the world that hold through t will have been asserted in the execution to that point, and no truth that holds at t will not have been asserted.

Still, there is an outstanding issue that pertains to the notion of decidability in the *Oilfurnace* storyworld: we may wish to evaluate certain propositions for which corresponding queries cannot be formed. This would occur when an attempt is made to evaluate a proposition that depends on something that is not modeled in the storyworld. For example, to adapt a predicate that Daniel Dennett has applied to Sherlock Holmes [257], we might wish to ask whether Ast Akrulikal has a mole on his left shoulder blade. While *Dwarf Fortress* is famous for its detailed modeling (e.g., of organ tissue [282]), I do not believe such a query could be formed, since the simulation does not represent moles and thus the software would not "understand" the query. More precisely, `false` would not be returned—as it would be if a query asked whether Ast's name is 'Batdwarf', for instance—but rather some kind of error would occur, since the query would not be well-formed with regard to the game's data representation. One might call the propositions corresponding to such

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queries *undecided,* which would mean that the *law of bivalence* (all propositions are either true or false) does not hold for *Dwarf Fortress* storyworlds, which would mean that they are incomplete.[32]

Alternatively, however, it is tempting to say that in such cases Ast does *not* have a mole, because such a mole is not modeled—that is, if a query cannot be formed, the negation of the corresponding proposition is implied. Is this fair, though? One could just as well say that anything about Sherlock Holmes that is not explicitly stated in the text of Doyle's stories is false. To me, however, it feels more intuitive to allow this in the case of a simulated world whose ontology is explicitly represented as structured data. Additionally, while Doyle could have written a new installment about the mystery of the mole on Holmes's left shoulder blade, thereby rendering the proposition's truth value decided, this cannot be done in the case of *Dwarf Fortress*: when the code that produces a given storyworld is changed, the world becomes inaccessible.[33] Thus, I contend that the world of *Oilfurnace* is complete, or at least that it *feels* complete: even if a detailed consideration reveals that the law of bivalence does not hold in computer simulation, it *feels* like it does. This feeling, which I will continue to validate throughout the rest of the section, is the bedrock that supports the notion that emergent narrative works like nonfiction. Even if one takes the ontological position that simulated storyworlds are not consistent, they still feel consistent, and this supports a particular set of aesthetics—these are the aesthetics of emergent

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[32]To be fair, it is not clear that this law holds for the real world either [1285, 840], as Ian Horswill noted in his thesis feedback.

[33]I admit that it would be possible for Tarn Adams to alter the code such that the storyworld remains accessible and intact, except for the advent of moles, through a clever engineering of the world-seeding functionality. Indeed, Adams spends considerable effort on ensuring backward compatibility in the game, which means storyworlds from old versions (stored as save files) can be used in newer versions [284]. That being said, what I am attempting to elicit here is a particular intuition: simulated storyworlds feel like closed systems, and fictional worlds less so.

narrative, which I outline in Section 3.2.[34]

Due to the nature of simulation and of computation more broadly, the simulated storyworld of *Oilfurnace* is also *consistent*. Recall that Heintz characterizes fictional worlds as being inconsistent when incompatible propositions are asserted—for instance, *Anna Karenina* implies both that the events of its story begin on a Monday and on a Tuesday. At a certain level of detail, this kind of inconsistency is impossible in computing, since it may be seen as requiring incompatible data to be stored in the same memory locations.[35] This points to a fundamental difference between a fictional world and a simulated world, which is that the latter emerges from a system of laws (the mechanics of the simulation), whereas the former obtains through a kind of human artifice. Of course, in simulation a human may still author the system of laws, but upon being authored those laws constitute a closed system that is consistent. It may not be consistent with the real world or whatever it may be modeling, but it is nonetheless an internally consistent system that is complete with regard to itself.[36] Thus, when it comes to consistency, human invention is mutable, while simulation tends not to be.[37]

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[34]As I have already explained above, my argument here is fundamentally aesthetical in nature, rather than ontological or even philosophical: I am interested, foremost, in how emergent narrative feels how it feels, and why humans like that feeling.

[35]This kind of *superposition* is actually possible in *quantum computing* [433], but the ontological implications of that paradigm extend far beyond our concerns here.

[36]I should mention a counterexample here. In his independent and collaborative doctoral work [1014, 1012, 1011, 1013], Justus Robertson has explored how incompatible assertions about a storyworld can be maintained as equally valid, using a metaphor of *superposition*. Specifically, a superposition (set of competing assertions) may collapse (onto a sole assertion) in accordance with a human observer's experience of the world. For example, an observer might encounter two doors, one on the left and the other on the right, whose respective connecting rooms have not been decided by the system. As the observer enters the left door, a connecting room is decided for it, and from now on the door on the left will always connect to that room, while the door on the right will not. Alternatively, had the observer entered the right door, *it* would have connected to that room and the left would not have. The ontological and aesthetic ramifications of Robertson's approach are fascinating and worthy of extensive discussion, though unfortunately that is also beyond the scope of this study.

[37]In his notes on an earlier draft of this thesis, Ian Horswill identified an important exception here: "there are lots of cases of games in which there is a detailed simulation, but there's something that appears in the game that's referred to, either in the dialog or in the visuals, that

It is worth addressing the potential counterclaim that these properties of completeness and consistency, to the degree that they are based in ontology, in fact apply to all works of computational narrative (i.e., even ones outside the paradigm of emergent narrative). Indeed, in each case a storyworld will obtain through the execution of a computer program. However, the primary difference, I contend, originates in the hallmark of emergent narrative: it is driven bottom-up by simulation, not top-down by narrative. In emergent narrative, the rules of the simulation are the laws that govern the storyworld itself, while in conventional computational narrative the rules of the simulation govern the narrative, the instantiation of which may *suggest* a larger storyworld in the same way that the prose of print fiction suggests a larger storyworld. For instance, consider the case of *Façade* [775]. There is a simulation at work—it models the physical environment of the apartment, the hallway outside it, and apparently the balcony outside [898]—but it does not model the entirety of the storyworld that the unfolding narrative implies. For instance, past events (such as a vacation in Italy) are implied, but these events are not actually simulated. The history of the world of *Oilfurnace*, on the other hand, was actually simulated prior to the beginning of gameplay—this is *Dwarf Fortress*'s famous *world generation* procedure [442, 751]. While all simulations have gaps (see Section 4.1.5) and imply extraneous material, this occurs less frequently as the level of simulation increases, and the hallmark of emergent narrative is intensive world simulation. As such, the storyworlds of emergent narrative feel more complete and more consistent, and so emergent narrative works more like nonfiction.

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isn't modeled in the world" (personal communication, July 28, 2018). This is a great point, and one that further erodes the basis for any argument that simulated storyworlds are real in an ontological sense. As I will explain more at various points below, my ultimate aim here is not to make ontological claims, but rather to argue in support of an artistic position: regardless of their true ontology, simulated storyworlds *feel* real, and this produces a distinct pleasure.

Formalist Perspective: *Oilfurnace*'s Tropes

As I outlined above, the *formalist perspective* on fictionality ignores the logical status of narrative content to instead focus on the stylistic tropes that characterize works of fiction. Identified tropes include a means of entering the subjective worlds of characters and surfacing the internal concerns found therein, often in a third-person voice. Intriguingly, the simulation of characters in a storyworld may easily support this phenomena: a system containing such a simulation will be omniscient with regard to it, in the sense that any truth about the simulation may be accessed through querying (as discussed above). Indeed, in my own work, I am deeply concerned with modeling of the internal lives of synthetic characters, and ultimately my goal is to surface interesting internal phenomena that emerges through such modeling. Does this make emergent narrative more like fiction, then? Not necessarily, I contend. First of all, nonfiction, as a genre of writing, is rarely divorced from the internal worlds of its characters (real individuals). Even beyond *new journalism* [1350],[38] classical 'objective' nonfiction writes about the internal worlds of individuals, sometimes as a byproduct of indirect access (e.g., through someone's diary writings), but often through a rational postulation. In any event, the only impediment to this direct accessing for the nonfiction writer is her lack of omniscience. But if an omniscient being wrote nonfiction that delved with perfect accuracy into the mind of a real individual, we would not say that such access turns that account into fiction.

As such, though the tropes of fiction identified by this formalist view may apply to works of emergent narrative, this does not mean they do not work like nonfiction. Moreover, through its characteristic omniscient access to a storyworld, emergent narrative enables a unique brand of nonfiction that is in fact only made

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[38]In the midst of writing this paragraph, I learned that Tom Wolfe, the figurehead of the new journalism movement, died today. Rest in peace.

possible through something like computer simulation. Indeed, the very possibility of omniscience in emergent narrative may be viewed as an argument for why it works like nonfiction. Again, however, this is a feature that is also present in other works of computational narrative, though again to a lesser degree corresponding to the reduction in explicit modeling of a storyworld.

Pragmatist Perspective: *Oilfurnace*'s Contract

According to the *pragmatist perspective*, fictionality depends on the *communicative intent* of the author and a kind of social contract that is consummated between author and audience. That is, nonfiction obtains when an author intends to produce nonfiction and the audience agrees that the artifact composed thereby is a work of nonfiction. Thus, nonfiction is made possible by a *shared pretense* [1261]. Here, we might consider a pivotal factor in the interpretation of *Oilfurnace*: whether the audience is aware of *Dwarf Fortress* and the comic's relation to it. To the uninitiated, the comic *constructs* a narrative set arbitrarily in a fantasy world, while to the initiated it *recounts* a narrative that emerged out of the game's famous simulation. Indeed, while I have not encountered the comic except as someone who was already aware of *Dwarf Fortress*, I suggest that the comic, as a standalone artifact divorced from any understanding of the game, is a strange artifact. Its narrational style is peculiar, and the quality of the narrative is perhaps even dubious. If Tim Denee were to write a story from whole cloth, he might produce something more extravagant—the quality of this story, however, is dependent on an understanding that the events that it recounts *actually happened*, in the sense that they emerged out of the complex interaction of processes in a computer simulation. As I will express more thoroughly in the later sections of this chapter, a story that recounts actual events will tend to be

inherently more interesting than a hypothetical fictional counterpoint with the same content. This is the basis for 'based on a true story'—it is what produces the *pleasure of nonfiction.*

In the case of emergent narrative, this means that the stories generated by this approach receive a boost in interestingness *when the audience is made aware of the simulational origins of the content.* To the degree that the simulation is inhibited through interventionist techniques, such as drama management or narrative planning, this interestingness boost dissipates.[39] One might even say that procedural narrative works like nonfiction to a degree that is commensurate to this interestingness boost. It is critical, however, to realize that the boost is not actuated merely by the simulational origins of a generated story, but by a *contract* between author and audience that transacts interestingness in exchange for guarantees about the 'actuality' of the recounted events—this might be called the *contract of emergent narrative.*

The primary takeaway here is that works of emergent narrative must do some work to emphasize the actuality of the recounted simulated events so that a contract, transacting such actuality in exchange for a boost in perceived interestingness, may be consummated between the author and the audience. This emphasis may be carried out in the content of the work itself, or in the *paratext* [387], meaning any external materials that frame interpretation of a work. In Chapters 10 and 12, I discuss how this contract is consummated in *Bad News* (primarily through its preliminaries and epilogue) and in *Sheldon County* (primarily through its paratext and the opening segment of each generated pilot episode).

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[39]I will expand on this argument in Chapter 5.

Whitean Perspective: *Oilfurnace*'s Curation

Finally, let us view *Oilfurnace* through the lens of Hayden White's model of historiography as a procedure of curation. By this procedure, which entails three distinct phases, subject phenomena of interest to historians are eventually recounted in historical accounts with particular rhetorical features.

First, the subject phenomena are captured, as they are transpiring, in a *chronicle* that records them by some method of inscription. While the chronicle itself is the result of a kind of curation, since it will never perfectly capture the subject phenomena (inscription is lossy), it is, for the historian's purposes, the raw historical record. That is, because it is the only documentation of the subject phenomena, it contains the only material that the historian may use to construct her account of that phenomena (though she of course may augment this, or adulterate it, with extraneous material). The chronicle is open-ended, with no narrative beginning (but rather the unceremonious onset of a process of recording that produced the record) and no narrative end (but instead an unceremonious termination of that recording process). From this chronicle, the historian crafts a *story*. This process entails the selection of a subset of the chronicled events, which may then be used to construct a discernible narrative structure in which some of selected events actuate *motifs*: *inaugural motifs* cue meaningful causal sequences that will culminate eventually with *terminating motifs*, and along the way *transitional motifs* signal abeyance in the causal sequence. Finally, the story is embedded in a particular *emplotment*—e.g., tragedy or comedy—which unlocks a set of rhetorical effects that support a targeted ideological stance.[40]

Let us now consider analogues between the components of emergent narrative

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[40]As I have noted already, while White delves into considerably more detail as to the latter stages of the historiographic process [1332], it is the initial steps that are of particular concern to our purposes here.

and White's notions of an historical field, chronicle, story, and emplotment. Again, we will consider emergent narrative through the concrete example of *Oilfurnace*.

First, what I have called the 'subject phenomena' of a story, White terms the *historical field*. In *Oilfurnace*, this corresponds to the unfiltered stream of simulated phenomena that transpired during Denee's gameplay session. For the most part, this phenomena is ephemeral, since it would be infeasible (from the standpoint of computer memory) for the system to record the whole plenitude.

As for White's 'chronicle', we might identify two analogues in *Oilfurnace*. First, whatever record keeping the system *does* manage to do (in terms of recording simulated phenomena) will result in a kind of chronicle (in the form of stored data). Second, Denee himself likely maintained a kind of chronicle in the form of notes or other inscriptions (whether physical or digital) recorded during the course of gameplay.[41] Note that the existence of multiple such records poses no trouble to this analogy, since for many historical concerns the notion of a chronicle takes the form of a composite record that combines information from multiple sources. Thus, we may say that in the case of *Oilfurnace*, these records combine together to form a composite chronicle.

Next, we may identify as an analogue to White's 'story' the subset of material from this chronicle that Denee selected for expression in the comic. Here, we even find White's 'motifs': an early panel reading "Strike the earth!" inaugurates the

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[41]We might also posit that Denee's own memory of the gameplay session is a kind of chronicle. I am not sure whether this idea would be in accord with White's thinking, but this may be due to the fact that he describes the particular case of historiography, and typically the historian is personally (and temporally) removed from her subject phenomena. As I articulate below, while I am interested in human-curated works like *Oilfurnace*, I am especially interested in the prospect of automated systems that procedurally curate simulated histories. This is what I am exploring now with my project *Sheldon County*, and as I explain in Chapter 12, I have found that such automatic curation is greatly assisted by the simulation maintaining extensive records of its generated phenomena. In this configuration, where one computer program is curating the material inscribed in a record kept by another computer program, we find an uncanny analogy to White's notion of the historian who constructs a story by curating a chronicle.

start of an extensive dig that terminates finally in the fatal demon invasion that was caused by the dwarves (hubristically) digging too deep. Along the way, a series of transitional motifs reference the discovery (through increased digging) of increasingly appealing minerals.

Lastly, White's 'emplotment' mechanism appears in *Oilfurnace* through its evocation of the tragedy, which is signaled frequently: a sense of doom is instilled immediately through the initial reference to four failed earlier attempts at colonizing Dread Island; new challenges are encountered and overcome, but victory is always tenuous; ultimately a final challenge (the demon invasion) cannot be overcome, and everyone perishes; the king's emergency letter, opened by Ast as a last resort, reminds the reader that "losing is fun".[42] Because there are different stakes to the rhetoric of historiography and to that of emergent narrative, White's articulated concerns at the level of emplotment and beyond become less relevant to our concerns here.[43]

Clearly, analogies abound between White's model of historiography and the process by which *Oilfurnace* would have been created. While White's greater aim is to show that historiography is primarily a rhetorical practice, the process

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[42]Indeed, this slogan and the tragic fatalism that it celebrates suggests that the emplotment of *Dwarf Fortress* gameplay itself is the tragedy.

[43]This is not to say that it would be impossible to curate emergent narrative to particular rhetorical effect. Indeed, my initial dissertation topic [1038] was a kind of story generation by which characters situated in a storyworld would curate their accumulated knowledge of that world (a kind of chronicle) to tell stories to one another to particular rhetorical effects. That is, it would be *pragmatic* story generation, whereby characters storytell as a way to change the world. Moreover, it is also certainly possible to do curationist emergent narrative in a way that would target a particular ideological stance (with regard to the real world, not just a simulated one). This is essentially one of the aims of my colleague Melanie Dickinson, who is exploring of use of social simulation for social justice [263]. Though not a work of emergent narrative, *Terminal Time* [768, 780, 268] is a remarkable example of procedural nonfiction that explicitly targets particular rhetorical effects. In the project, an AI system works to generate a documentary film that exaggerates an audience's collective stance on an issue to the level of a lampoon. Michael Mateas, who is one of its cocreators (along with Steffi Domike and Paul Vanouse) and also my coadvisor, recently told me that several individuals who experienced the piece remarked that it was essentially operationalizing the ideas of Hayden White.

of curation that he describes signals a critical distinction between fiction and nonfiction. To emphasize this point, let us again consider White's articulation on the matter (which was already quoted earlier):

> Unlike literary fictions, such as the novel, historical works are made up of events that exist outside the consciousness of the writer. The events reported in a novel can be invented in a way that they cannot be (or are not supposed to be) in a history. This makes it difficult to distinguish between the chronicle of events and the story being told in a literary fiction. In a sense, the "story" being told in a novel such as Mann's *Buddenbrooks* is indistinguishable from the "chronicle" of events reported in the work, even tough we can distinguish between the "chronicle-story" and the "plot" (which is that of an Ironic Tragedy). Unlike the novelist, the historian confronts a veritable chaos of events *already constituted*, out of which he must choose the elements of the story he would tell. [1332, p. 6]

As I have noted above, I think it is fair (and valuable) to consider White's model as a description not just of historiography, but of nonfiction more generally. In taking this broader view, we find an even stronger account of how emergent narrative works like nonfiction: in fiction and other forms of computational narrative, the subject matter of a story is instantiated *through the process of narration*, whereas in emergent narrative these events are *already constituted at the time of narration*.[44] Note that this is especially the case in curationist emergent narrative, where effort is dedicated to the construction, through curation, of an actual narrative artifact. Indeed, I contend that this curationist approach does better than any other method for emergent narrative to unlock the pleasures of nonfiction and the aesthetics that result thereby. Let us conclude this section with a quote from Tim Denee, in which he himself describes the creative process

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[44]In his comments on an earlier draft of this thesis, Ian Horswill wrote: "This is a great model for Oilfurnace, but DF itself doesn't have a curator. So would you then say that a person just 'playing' DF, and not curating a story about it for a third person, was not experiencing emergent narrative?" I address this matter extensively below, in multiple sections, so if you are wondering the same thing, hold tight or else jump to Section 5.3.2.

that produced *Oilfurnace* as one that resembles the curation procedure described by Hayden White:

> I think Dwarf Fortress generates such complexity and depth of information, that the task of the storyteller is to simply sift through and find the narrative [**?**, n.p]mastrapa2010kiwi

3.1.2   Analogy to Stories of Lived Experience

In the fall of 2002, I was fifteen years old and deeply immersed in *Grand Theft Auto: Vice City* [883]. The game was enjoyable to me not for its notorious content and violent gameplay, but for its simulation of a vibrant bustling city. Earlier open-world simulation games had typically been set in fantasy or science-fiction environments, but this game was set in a version of the real world, which appealed more to my tastes.[45] Most importantly, the game's emergent possibility space seemed marvelously vast. I felt that I could navigate this space in a constructive manner—like I was crafting a story through the way that I played.[46]

Eventually, I became disenchanted by the hollow modeling of non-player characters (they do not afford meaningful interactions beyond different types of collision) and particularly by the lack of world persistence: due to memory constraints, only the player character's immediate vicinity is simulated, which means that characters and objects leave memory (and disappear forever) as soon as one turns a

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[45]For this reason, I often feel like an outcast among videogame players, developers, and scholars, but I have a comrade in Gonzala Frasca: "I find most fantasy-related videogames quite boring. I have always preferred stories about human affairs and social issues to magic spells and mean dragons. This is why I always salute any attempt to bring human characters to videogames" [355].

[46]This idea of gameplay as a constructive act that produces a kind narrative is the crux of Aaron Reed's notion of *sculptural fiction* [984]. To the degree that such an act works like a collaboration between system and player, the work affording such interaction falls in the purview of Ben Samuel's *shared authorship* [1084]. Later on, I will discuss these ideas in more depth, since they relate to aspects of my framework for curationist emergent narrative. Interestingly, much of the earliest writing on interactive fiction viewed the reader as co-author [543, 48, 217, 156, 39, 1378, 1167, 416, 417] or "co-actor" [40, p. 61] or "prosumer" (portmanteau of 'producer' and 'consumer') [1119, p. 60]; these terms evoke Bertold Brecht's "spect-actor" [121].